ARCHIVES OF OPHTHALMOLOGY.

A CASE OF SYMMETRICAL CONGENITAL ABSENCE OF CHOROID AND RETINA EXCEPT IN THE MACULAR AREA.

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(With two figures on Text-plate IX.)

Jan. 23, 1903.—The patient was a brunette and forty-four years of age. He had always been well, but his vision had been poor during his whole life. He had experienced great difficulty in orientation and in passing from and into places of different degrees of illumination. He hangs his head a little and nips his lids as an albino does.

His father never wore glasses to read, even at the age of seventy-five years. Two of my colleagues saw the case with me. The patient died April, 1903.

Stat. Præsens: The pupils are small and react slowly to light. The tension is normal in each eye. The muscular movements are normal. The irides are normal and of a deep blue color. Color-sense is normal, except in his calling a skein of very light green worsted yellowish. When examining these skeins he would bring them very close to his eyes. The visual fields, tested at first by the hand, showed only central or direct vision. The fields were taken with difficulty by the perimeter, and each eye showed an irregular concentric contraction of the visual field to about three degrees.

O D, V = $\frac{6}{18}$. Reads Jr. 3 in 10 inches; with — 1 D^c ax. 90°, V= $\frac{6}{8}$.

O S, V = $\frac{6}{18}$. Reads Jr. 5 in 10 inches. No improvement in distant vision with lenses. Reads Jr. 3 with + 2 D^s.

Ophthalmoscopical examination of the right eye showed a brilliant white reflex. The sclera showed through everywhere; the perfectly white background is relieved only by the presence of the pale disc with its narrow central vessels, and a vascular

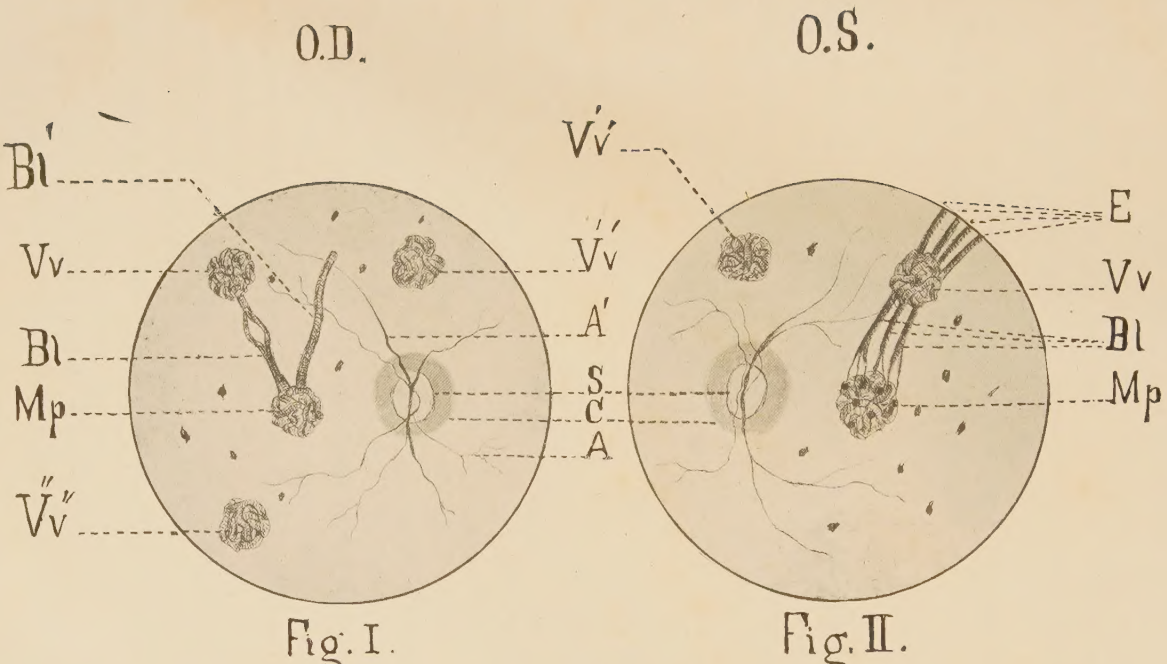
plexus (Plate IX, Fig. 1) in the macular region about the size of the disc or perhaps a trifle larger, with two blood-vessels (Bl and Bl′, Fig. 1) ascending upward from the plexus.

Here and there, scattered throughout the fundus, were small thin masses of pigment about the size of half a pin-head. No choroidal vessels were anywhere visible. The central artery and vein (A and A′, Fig. 1) were very minute and undeveloped, and soon after leaving the disc became so attenuated that in parts of the retina somewhat remote from the disc they were scarcely discernible.

In the macular region is a group of small and large vessels forming a fluffy plexus (Fig. 1), and filling an area a trifle larger than the disc. From the upper-outer portion of this plexus a large broad vessel (Bl, Fig. 1) in a single trunk passes obliquely upward and outward toward the periphery of the fundus, divides into two streams, which unite again to form a single vessel just before it loses itself in a plexus of vessels (Vv, Fig. 1) in the upper-outer periphery of the fundus, presumably the vorticose vein. From the inner-upper corner of this same macular plexus a broad vessel (Bl′, Fig. 1) starts upward and inward, and, on a line with the vorticose vein just mentioned, sinks abruptly through the sclera and is lost to view. Nasally from this vessel is another group of vorticose veins (V′v′, Fig. 1) with no vessels of any kind issuing from it or going to it. In the outer-lower periphery of the fundus another group (V″v″, Fig. 1) devoid of outgoing and incoming vessels can be seen forming a vorticose vein. These two groups (V′v′ and V″v″, Fig. 1) form isolated islands on the white sclera.

To sum up, then, we see three groups of vorticose veins, a macular plexus of vessels with two ascending broad vessels, and a pale disc with diminutive central vessels, but no choroid anywhere. No cilio-retinal vessels could be seen. The disc is surrounded by a very broad scleral ring (S C, Fig. 1).

The description applies to the fundus of the left eye, except here there are only two vorticose groups (Vv and V′v′, Fig. 2) in the upper part of the fundus, none at all in the lower portion of the fundus. There is also a difference in the arrangement of the blood-vessels coming from the macular plexus. The vessels (Bl, Fig. 2) issuing from this plexus are three in number, and pursue an almost parallel course



A A′, Central artery and vein.
Vv, V′v′, V″v″, Venæ vorticosæ.
Mp, Macular plexus of blood-vessels.

Bl and Bl′, Blood-vessels issuing from the macular plexus.
S, C, Scleral ring.
E, Vessels issuing from vorticose veins.

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upward and outward to a venous plexus (Vv, Fig. 2). They start as very small branches which soon converge and make a very thick trunk. From the outer and upper vorticose group (Vv, Fig. 2) numerous vessels (E, Fig. 2) pass toward the periphery and are lost to view. There were seven small faint blotches of pigment in the macular plexus.

A brief review of some embryological facts may aid us in reaching an explanation of this unusual case.

I.—IRIS.

The retina is an ectodermal structure. The primary optic vesicle by a sinking in of its summit to the bottom of the vesicle is converted into the secondary optic vesicle or optic cup. The two layers thus formed of ectodermal cells become ultimately the pigment layer and the nervous layer proper of the matured retina. The portion of the iris which is first laid down is formed by the anterior zone of the optic cup, which grows forward thinning as it advances, and passes around the lens, which has by this time been severed from its ectodermic connection; thus the foundation of the iris is formed from the two primary layers of the retina, and the pigment from the outer retinal pigment layer passes into the posterior primitive layer. Almost at the same time the mesoderm grows forward between the ectoderm and anterior surface of the lens, and mingling with the part of the iris already developed forms the stroma of the iris, thus furnishing the connective tissue, muscles, and blood-vessels. This has taken place before there is any advanced development of the choroid.

In other words, the mesoblastic cells which have formed the stroma of the iris have acted independently of the same layer of cells which form the choroid and precede the development of the latter.

The pigment of the iris is from two sources; namely, from the retinal pigment and connective-tissue pigment cells—i. e., mesoblastic cells.

II.—RETINA.

The posterior zone of the optic cup forms the true retina: the inner layer increases in thickness and about this time the membrana vasculosa retinæ appears. "The membrana vasculosa retinæ is formed out of mesodermic cells which enter the bulbus with the arteria hyaloidea" (Voll, 1, p. 93). It is a thin highly vascularized membrane which lines the inner surface of the retina. A network of blood-vessels now spreads over this membrane. The network begins near the edge of the optic nerve and spreads forward to the ora serrata. This network is probably supplied by branches of the posterior ciliary arteries. At a time when the blood-vessels of the vitreous begin to disappear, a union takes place between the vessels of the membrana vasculosa retinæ and the hyaloid artery which now receives the name of the central artery of the retina.

Thus it is seen that *the arteries of the retina are not at first branches of the central artery but become so by this union* as above described. This takes place between the third and sixth month in the human embryo.

It might be well to consider the extent of vascularization of the retina in some of the lower animals in order to compare it later with the case under consideration.

Very recently Nettleship found in many of the lower mammalia that the retinæ are almost entirely supplied by cilio-retinal vessels, which "reach the retina by passing round the sclero-choroidal border of the disc." "The central artery is seldom if ever quite absent, though often reduced to a minute vessel entering the optic nerve close to the eye."

According to O. Schultze: In rabbits the retinal vessels are scantily developed. In horses the retina is vascularized only in the region of the optic nerve; the remaining portions have no retinal vessels. In the pig the membrana vasculosa retinæ is vascularized from the periphery of the papilla. This is also the case in the cow.

He says moreover: "In the dog, fox, and cat the vessels of the retina retain their embryological character; an arteria centralis retinæ is wanting." In the cat the retina from the

equator to the ora has no blood-vessels; from the equator to the opticus the retina contains vessels. All of the vessels of the retina arise from the edge of the disc; also all of the blood-vessels of the retina are branches of the posterior ciliary arteries.

In very many of the vertebrates the *retinal vessels come from the cilio-retinal system.*

III.—CHOROID AND SCLERA.

The choroid and sclera are formed by a conversion of mesoblastic cells which have attached themselves early to the secondary optic cup. The sclera is formed later from these cells after they have given off a layer for the formation of the choroid. From the vascular arrangement it is probable that the choroid is only *secondarily* a part of the mesoblastic cells which form the stroma of the iris and the ciliary body.

A distinct differentiation between choroid and sclera begins about the fourth month in the human embryo, when vascularization of the choroid is already quite marked. The vessels of the choroid begin to appear about the *second month.* According to O. Rieke, the embryological connective-tissue cells acquire the specific power of creating pigment in their protoplasms at the *seventh month* in the human embryo. The aid of the blood-vessels is not essential to the production of the pigment.

IV.—BLOOD-VESSELS.

We have three systems of vessels to consider:

1. The short posterior ciliary arteries which are mostly branches of the long posterior ciliary arteries, but a few arise from the arteria ophthalmica. Branches of the short posterior ciliary arteries form the arterial circle of the optic nerve, which unites with branches of the central artery. The cilio-retinal vessels arise from this circle. It is probable that the cilio-retinal arteries found in the matured eye are remnants of this embryological state. The short posterior ciliary arteries *supply the choroid proper.*

2. The long posterior ciliary are branches of the arteria ophthalmica and supply the *iris and ciliary body.*

3. The anterior ciliary arteries arise from the arteries of the recti muscles and *supply the iris and ciliary body.*

In the case under consideration, *no* long posterior ciliary arteries could be seen coursing over the sclera forward toward the iris and ciliary body, hence *these arteries must have been obliterated* and consequently *the iris and ciliary body received their blood supply from the anterior ciliary arteries.* There was neither choroid or choroidal vessels, hence no posterior ciliary arteries within the bulbus. The *macular plexus* (Pl., Figs. 1 and 2) *was probably supplied by branches of the posterior ciliary arteries which passed directly through the sclera* and did not come out of the edge of the disc like the usual cilio-retinal vessels.

In the frog and in the lower vertebrates there are only two venæ vorticosæ. In this case there were three in the right eye and two in the left.

Conclusion.—From the external appearances nothing of the internal defects would have been suspected. We have, then, two eyes symmetrically affected. No choroid and no choroidal vessels; a small area of retina which functionates; undeveloped vein and central artery which does not supply the macular retinal area, this area, however, being supplied by branches of the short posterior ciliary artery; no posterior ciliary or long posterior ciliary arteries within the bulbus; an anomalous state of the vorticose veins; a normal ciliary body and iris supplied by the anterior ciliary arteries, and a normal vitreous and lens.

The fact of the centripetal ingrowth of the axis-cylinder fibres of the ganglionic cells of the retina would more easily explain the isolated area of retina than were the fibres to grow from the brain into the retina. The idea prevails that intraocular tension is maintained by transudation from the choroidal vessels, and if it were not for this, filtration would occur through the coats of the eye and the bulb would shrink. This is surely refuted by this case.

The pigment probably was formed in the outer layer of the retina without the aid of blood-vessels, but perhaps its

renewal was subsequently interfered with by the obliteration of choroidal vessels, and perhaps this accounts for its absence throughout the fundus.

The facts would indicate an anatomic *independence of the iris and choroid.* "The existence of a vascular connection between lens and choroid at no time can disturb the development of the iris" (von Hippel, Graefe-Saemisch).

A union between the vessels of the tunica vasculosa retinæ and hyaloid artery probably had taken place because the central vessels have a normal arrangement, although undeveloped.

By referring to the preceding portions of the text we may infer that the circumscribed area of the retina is a reversion to a state found in the lower vertebrates. I have been unable to find any vertebrate with eyes normally devoid of a choroid, and consequently can only consider this as an imperfect case of atavism.

Another feature of interest is that the blood from the macular region is not carried off by the central veins of the retina but by vessels which empty directly into the vorticose veins.

We have, then, an *arrest of development* of the choroid and the retina due to an *embryological obliteration* of the entire group of the *long posterior ciliary arteries* and an almost complete *obliteration* of the *short posterior ciliary* except that which nourishes the macular plexus.

I have found a report by Dr. Cowgill (ARCH. OF OPHTH., vol. xxi.) of one case which falls under this type but differing essentially from the case which I have described. The macular plexus in this instance in each eye was supplied by cilio-retinal vessels. The central retinal vein and artery were normal in size and distribution and the venæ vorticosæ were not visible.

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EYE INFECTION. SECOND HUNDRED CASES WITH BACTERIOLOGICAL EXAMINATION.

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BACTERIOLOGICAL examination in infection of the eye occasionally gives plain indications for treatment, and is so often a source of satisfaction in revealing just what enemy we have to fight that we have continued it as a routine procedure. While the really savage infections command our greatest care, perhaps we pay too little attention to the less severe ones whose potential power for evil may be equally great. It has therefore seemed worth while to report briefly the examination of another hundred cases of eye infection as an indication of what is going on in the ordinary mild cases of which we see the most.

These cases occurred in the private practice of Dr. F. M. Wilson and myself, in the ophthalmic clinic of the Manhattan Eye and Ear Hospital, and in the wards of the Bridgeport General Hospital. They are unselected, all cases being included in which any attempt at bacteriological examination was made. So far as possible, clinical and bacteriological study were carried along together. Part of the laboratory work was done in the Sheffield Bacteriological Laboratory of Yale University, and my acknowledgments are due to its head, Dr. L. F. Rettger, for much valuable assistance.

Technique: Except as noted, the material examined was the conjunctival discharge, collected on very small swabs which had been sterilized at 150° to 160° C. for one hour. After everting the lid, the swab was gently pushed down into the purulent material in the lower cul-de-sac, or used to pick up bits of discharge from the conjunctival surface,

great care being taken not to touch the lashes or the edge of the lid. Dry secretion in the inner canthus was avoided. In the case of styes, abscesses, etc., after carefully cleansing the surface, the swab was pushed into the incision. The usual routine was to inoculate culture tubes from this material and to make two smears, staining one with methylene blue and one by Gram's method and safranin, or with weak carbol fuchsin. In making smears, the pus-covered swab was rubbed very gently over a clean slide, which was allowed to dry in the air before fixing in the flame. Two or more cultures were regularly made, one on agar (reaction + 1.0 to phenolphthalein), and one on either Loeffler's blood serum or a similar medium in which human ascitic, pleuritic, or hydrocele fluid was substituted for the serum. Such of the organisms as grew on either of these media, and were also present in any considerable number in the smear, were isolated on agar plates or by successive strokes on blood serum, and their colonies studied. The pure cultures thus obtained were grown on other media and identified by the usual methods.

One hundred patients are included, one hundred and fifty-nine eyes being affected. The cases are grouped as infections of the conjunctiva (65 cases), of the cornea (10), of the lachrymal sac (10), and other cases (15).

CONJUNCTIVAL INFECTION: 65 CASES, 122 EYES.

Staphylococcus Conjunctivitis. Staphylococci are usually present on the conjunctiva, and if the conjunctival power of resistance to infection is lessened in any way, staphylococcus infection may take place. This infection takes one of three forms. Either (1) Diffuse (*i.e.* simple staphylococcus conjunctivitis), with more or less free conjunctival discharge; or (2) Focal (*i.e.* phlyctenular conjunctivitis), where the infection is localized in foci near the limbus, and there is little or no conjunctival discharge; or (3) the two forms combined. If the lowered resistance is due to poor nutrition or poor hygiene, as, for example, in run-down or scrofulous children, the focal form is especially common.

While any single attack of this form may be cut short by the application of mercury to the focus of infection, the tendency to recurrent attacks can only be combated by improving the nutrition and the general health, and this is consequently an important part of the treatment.

Staphylococcus Conjunctivitis, ordinary or diffuse form. Eleven cases. These were cases in which the predominating organism, which was very abundant in the smear, was identified as one of the staphylococci by cultures on blood serum, agar, and gelatine. In five cases the staphylococci occurred alone; in four the xerosis bacillus, in one the hay bacillus, and in one a member of the colon group were present also. The albus occurred oftener than the aureus. The cases were all mild, of short duration (not more than three days except in two cases), and, except for these two cases, recovered under hot water and boric solution in two to four days.

Staphylococcus Conjunctivitis, combined focal and diffuse form. Three cases. These occurred in children of two, six, and seven years of age respectively. In one, staphylococcus aureus and micrococcus Hauseri were found in smear and culture of the conjunctival discharge. In another, a pleomorphic micrococcus and a few xerosis bacilli were found. This was probably the same micrococcus as in the first case, but identification was not completed. In the third case, the staphylococcus albus and two bacilli belonging apparently to the colon and subtilis groups were found. The cases recovered in three to five days with boric acid, calomel to the phlyctenule, and proper diet.

Diplobacillus Conjunctivitis. Six cases. These were cases of subacute conjunctivitis, in the discharge from which the diplobacillus of Morax and Axenfeld was the prominent or sole organism. The redness, discharge, and annoyance to the patient in all these cases were slight but persistent. Both eyes were affected, with one exception, for from four to eight weeks before coming under observation. Three patients were males, three females; five were young adults. In four cases there is no record of the result of treatment. One case showed no improvement under boric solution and argyrol for five days, but was well after three days of zinc

chloride. One which resisted other treatment for five weeks recovered with zinc in six days.

Pneumococcus Conjunctivitis. Twelve cases. Six were clinic cases of all ages, rather mild, of two to four days' duration, and with both eyes affected, one a day or two before the other. Secretion was free but redness and pain were not great. The pneumococcus was found alone in smear from all the cases, and confirmed by culture in two of them. In these a few colonies of the adventitious organisms (staphylococcus or xerosis bacillus) also appeared. These cases were treated with boric solution every two or three hours, and argyrol (30 %) two or three times a day. In one case secretion ceased on the second day, in one on the fourth day; the others were not seen again. Another mild case, well in four days under boric and hot water, showed a few staphylococci and xerosis bacilli, along with abundant pneumococci. Three cases of moderate severity, treated with hot water and boric every two hours, showed pneumococci in smear and culture, twice alone, once with hay bacilli also, recovering in seven, ten, and twelve days respectively. In two other cases no cultures could be obtained, but the pneumococcus was present alone in the smear. In one, a woman of thirty-five, left eye affected for two days, the attack was savage enough to raise the question of gonorrhœal infection, but it yielded so promptly to hot water and boric solution that no pus could be obtained for culture on the second visit, and the patient was well in four days. The other case was less severe and cleared up rapidly under boric only.

Gonorrhœal Conjunctivitis in the new-born. Six cases. In three of these the gonococcus was found alone in the smear, and in one of them was cultivated. Two were treated in the hospital with argyrol and silver nitrate. Both were removed from the hospital while eyes were still secreting, one in three weeks, one in one. One case treated with argyrol and vaseline was especially slow, remaining in the hospital for nine weeks before the discharge ceased, and after two weeks at home returning with reinfection in both eyes. The other three cases showed no organisms in the smear and no cultures were made. One of these was a

clinic case and the record is wanting. The other two were treated with vaseline as soon as seen, thereby increasing the difficulty in finding micro-organisms. They were both clinically gonorrhœal, however, and were treated in hospital for three weeks each, with special nurses to cleanse the eyes with boric and vaseline. Later argyrol was used. One of these cases had a perforating ulcer of the cornea upon entrance, possibly in consequence of previous treatment with too strong silver solution. The other three eyes made perfect recovery.

No organisms were found in three cases of mild conjunctivitis. In two, of which clinical record is lacking, only smear was made. In one, which recovered in six days under boric solution, no smear was made, but cultures from both eyes remained sterile.

Streptococcus Conjunctivitis. Three cases. In these the streptococcus was the predominating organism in smear and culture. In one case the infecting material clearly came from a dacryocystitis, both the conjunctival discharge and the pus from the lachrymal sac containing streptococci only. The records of the other cases are deficient; one showed streptococcus only, the other staphylococcus, hay bacillus, and leptothrix.

Meningococcus Conjunctivitis. One case. A nurse, who had just left a fatal case of cerebro-spinal meningitis, developed a moderately severe acute infectious conjunctivitis of both eyes, not clinically distinguishable from a pneumococcus infection. Duration: right eye, two days; left eye, one day. Smear and cultures of the conjunctival discharge showed the diplococcus intracellularis meningitidis of Weichselbaum and a few xerosis bacilli. Recovery in five days under hot water and boric acid.

Unidentified Diplococci were found in smears from five cases in which cultures were not made. One case was probably gonorrhœal, taking four weeks for complete recovery.

Diphtheritic Conjunctivitis. One case. This occurred in a child of five months in a family, two of whose members had recently recovered from faucial diphtheria. The

clinical picture was not typical, being nearer that of a gonococcus than a regular Klebs-Loeffler infection. The upper lids were greatly swollen and œdematous so that they could not be everted until the swelling began to subside, when no false membrane was found. The discharge from the right eye contained no organisms; from the left, staphylococcus aureus and Klebs-Loeffler bacillus, the latter being found in the nasal secretion also. Duration of infection was about ten days for right and six for left eye, when first seen. The corneæ were not affected, and there was no marked constitutional disturbance at any time. The condition improved so rapidly under simple cleanliness that antitoxin was not used; and the eyes became quiet in ten days. We have classed this case as diphtheritic, although there is reasonable ground for doubt as to whether the Klebs-Loeffler bacilli actually took part in the infective process. The bacilli isolated from this case were among those used at the Sheffield Bacteriological Laboratory in repeating Dr. Arnold Knapp's experiment with fermentable sugars in Hiss's serum-water media. In this we found like results, *i.e.*, diphtheria bacilli fermented dextrin but not saccharose. Xerosis bacilli did the reverse, while the pseudo-diphtheria bacillus fermented neither.

Bacilli but no cocci were found in twelve cases of conjunctivitis. Three of these were severe. In one case the bacilli in the smear seemed to be the Koch-Weeks. In another case, clinically the same, the bacilli were larger and slightly irregular. In both cases the organisms were largely in the pus cells. No cultures were made. Both were clinic cases and were seen but once. One case in a man of sixty-nine, three days' duration, both eyes affected, was characterized by a watery œdema of the conjunctiva, which projected from the lower cul-de-sac out between the lids. Secretion was very scanty and material for a smear could not be obtained. A sterile swab was pushed down into the cul-de-sac and transferred to a tube of blood serum. In forty-eight hours, growth from one eye showed xerosis bacillus only; from the other, xerosis and a diplococcus. On the fourth day, a growth of the hay bacillus crowded out

the other organisms and killed off the diplococcus before identification. Recovery in two weeks.

The remaining nine cases were mild. In five some member of the subtilis (hay bacillus) family was found in culture, and in three of these in smear, no other organisms being found. These cases were characterized by little discharge but considerable irritation. They were all treated with boric and hot water, recovering in five to six days. Whether there is a *subtilis* type of conjunctivitis is not determined, although there seems to be some ground for thinking that members of this group do occasionally take some part in conjunctival infection.

Irregular Cases.—In a man of thirty-four, discharge from a mild conjunctivitis, both eyes, showed a diplobacillus belonging to the colon group and a few xerosis bacilli. In three cases, one eye only affected, the bacillus coli communior, an unidentified diplobacillus, and the xerosis bacillus, respectively, were found. In two active trachomas, with pannus, the conjunctival discharge contained a variety of bacilli.

CORNEAL INFECTION: TEN CASES. TWELVE EYES.

Two cases of necrosis of the cornea in which the infection extended to the cellular tissues of the orbit and the eyes went through panophthalmitis to phthisis bulbi. In both of these the streptococcus was the prominent organism. In the first case, a man of forty-two, duration one week, there was no history of injury. The entire cornea was sloughing, and in the necrotic material the following organisms were found: Streptococcus, an encapsulated diplobacillus (growth viscid on blood serum, probably B. mucosus capsulatus), hay bacillus, and an occasional staphylococcus aureus. The growth of the hay bacillus prevented identification of the diplobacillus. In the second case, a man of twenty-six, duration five days, there was history of repeated attempts at removal of a foreign body from the cornea. When first seen there was a sloughing ulcer of the cornea, about one-fourth inch in diameter, surrounded by a large zone of infiltration, and some chemosis. The free

conjunctival discharge contained abundant streptococci and bacilli lying in parallel groups. These cases were treated in hospital for five weeks each.

The streptococcus was also prominent in the conjunctival discharge of two cases of ulcerative keratitis which made good recovery. One, a woman of fifty, one week duration, well in three weeks under atropine, vaseline, and occlusion, showed streptococci and a few staphylococci albi and xerosis bacilli. In the other, a woman of sixty-five, the streptococcus and pyocyaneus bacillus were present. The keratitis was well in eight days under atropine, vaseline, and occlusion, but the bulbar conjunctiva became infected opposite the lower punctum, from which pus loaded with streptococci exuded upon pressure over the lachrymal sac. A similar mode of infection was illustrated by one of the lid cases. A severe conjunctival infection with great redness and watery chemosis was found chiefly localized on the bulbar conjunctiva, opposite the minute opening of a stye, inside the upper lid. Through this opening pus containing staphylococcus aureus constantly exuded.

Two cases of ulcerative keratitis in men of twenty-nine, recovering in five and twenty days respectively, under atropine, vaseline, and occlusion. The first followed removal of foreign body, and showed staphylococcus aureus and albus in the conjunctival discharge. The other was a recurrent attack of five days' duration. The discharge was too scanty to allow material for smear, but culture from conjunctival cul-de-sac showed xerosis bacilli only.

Two cases of ulcerative keratitis, both eyes, in poorly nourished girls of six and four respectively, who also showed various eczematous conditions. In one, photophobia was excessive, and the conjunctival discharge which spurted out whenever the lids were separated contained abundant staphylococci aurei and a few xerosis bacilli. These organisms were found in the conjunctival pus two months later when a phlyctenular conjunctivitis developed. In the other case, secretion was almost as free, but the smear showed no organisms and cultures were not made. Both cases recovered slowly, with frequent relapses.

Keratitis occurring in a glaucomatous eye in a woman of forty-five. Recovery from keratitis prompt. Conjunctival discharge contained the hay bacillus and a diplobacillus not identified.

Herpes of cornea in a man of sixty-five, who made good recovery under atropine to eye and quinine internally. Smear from the free conjunctival discharge showed a very large diplococcus and an irregularly staining bacillus. Culture was not made.

LACHRYMAL INFECTION: TEN CASES, TEN EYES.

In three cases of abscess of the lachrymal sac the pus from the incision showed: Streptococci in smear from a man of thirty; streptococci only in smear and culture from a woman of the same age; no organisms in smear, xerosis bacillus in culture, from a woman of fifty. One of these cases continued treatment, and recovered without epiphora after some months of probing.

There were seven cases of dacryocystitis with bulging of the sac but no redness or pain. All were in women. Three (aged twenty-eight, fifty-six, and forty-five, respectively) showed pneumococci only in smear and culture; one (twenty-nine), pneumococci and streptococci; one (forty-one), streptococci only,—this case, like the case of keratitis described above, developed a conjunctival infection opposite the lower punctum; — one (forty-six), bacilli; one (forty-five), staphylococci aurei in abundance and a few bacilli. The bacilli in the last two cases were not identified.

In the previous hundred cases,[1] a case of dacryocystitis by extension from a streptococcus conjunctivitis was mentioned. It seems more likely in the light of these cases that a dacryocystitis had previously existed and was the source of the germs, but was for a time quiescent.

OTHER CASES: FIFTEEN. FIFTEEN EYES.

Four inflamed chalazia were incised, their walls broken up with scissors or curette, and the contents inoculated on blood serum. Xerosis bacillus grew once, staphylococcus albus

[1] *Manhattan Eye, Ear, and Throat Hospital Report*, No. vi., p. 174.

once, while two remained sterile. Three styes were incised and the pus examined. One contained staphylococcus aureus, one a micrococcus, and one a diplococcus. No identifying cultures were made in the last case, or in a case of abscess of the lid in which also smear showed a diplococcus. Probably these diplococci were staphylococci. Smear from a sebaceous cyst above the inner canthus showed no organisms. The skin was touched in collecting material, which may account for the few staphylococci aurei found in culture. The stringy muco-purulent discharge found in the conjunctival sac at the first or second dressing after cataract extraction was examined in three cases. Staphylococcus aureus was found twice, once with the xerosis, and once with an unidentified bacillus. In the third case, a woman of eighty-five, in whom an infective iritis, which eventually destroyed sight, was then developing, a bacillus closely related to the colon group was found. In a similar case, following needling for congenital cataract in a girl of six, staphylococcus aureus, xerosis bacillus, and a member of the subtilis group were found.

In two cases of ruptured globe, the discharge from the eye showed staphylococcus albus once, and once pneumococci and micrococci.

SUMMARY.

Of the sixty-five cases of conjunctival infection, thirty-eight (about three-fifths) were caused by four common germs; fourteen by the staphylococcus; twelve by the pneumococcus; six by the gonococcus; and six by the diplobacillus. In the remaining twenty-seven cases no one organism was especially prominent. Of the ten corneal cases, the streptococcus occurred in four; the staphylococcus aureus in two. Of ten lachrymal cases, pneumococci and streptococci were present in seven. In ten cases no organisms of any kind were found.

In the table on the opposite page the organism "predominating" in the smear, if two or more kinds were present in any considerable number, is assumed to be the most important; while other organisms present are placed in the

"associated" column, unless their numbers were so few as to make them seem clearly adventitious, in which case they are not mentioned at all.

TABLE OF ORGANISMS FOUND.

	Alone or predominating.					Associated.	Total.
	Conjunctival infection.	Corneal infection.	Lachrymal infection.	Other cases.	Total.		
Pneumococcus	12		4	1	17		17
Gonococcus	3				3		3
Streptococcus	3	4	3		10		10
Staphylococci	13	2	1	6	22	8	30
Micrococci	1			1	2	2	4
Meningococcus	1				1		1
Other diplococci	5	1		2	8	1	9
Diplobacillus of M. and A.	6				6		6
Koch-Weeks B	1				1		1
Klebs-Loeffler B	1				1		1
Bacilli belonging to Subtilis group	5	1			6	9	15
Colon group	3			1	4	2	6
Xerosis group	2	1	1	1	5	13	18
Bacilli unidentified	1		1		2	7	9
No organisms	6	1		3	10		10
Unsatisfactory	2				2		2
Leptothrix						2	2
Bacillus pyocyaneus						1	1
Total	65	10	10	15	100		

The pneumococcus, the various staphylococci, and members of the xerosis and subtilis groups of bacilli were the organisms most frequently found. The Koch-Weeks bacillus, the diplococcus intracellularis, and the diphtheria bacillus occurred but once each. The colon group was represented in several cases. The small number of gonococci found is partly due to the interference of vaseline with the bacteriological examination. The xerosis group (for there seem to be several closely related organisms which vary in some slight regard from the bacillus xerosis as described by Migula) was represented in eighteen cases, in a variety of

pathological conditions. While these organisms probably took no part in the process in many of these cases, in some this is not so certain. Members of the subtilis group of bacilli were present in fifteen cases, in five of these alone. In the preceding hundred cases the members of this group, of which the ordinary hay bacillus is the best known, were considered either as accidental organisms or as contaminations from improper technique or imperfectly sterilized media. By a large series of control cultures, however, it has been found that the latter supposition was not true for this series of cases. When subtilis bacilli were recognized in the smear, they grew in culture in less than twenty-four hours. When not found in the smear, they usually did not appear in culture until the fourth or fifth day; while in every case the control remained sterile. This would indicate that the organism existed in the eye in these latter cases in very small numbers. Furthermore, certain cases of conjunctivitis occurred with excessive irritation in proportion to the amount of redness and secretion, in which hay bacilli were found alone in smear and culture of the discharge. In view of these facts, we cannot be sure that these organisms are in every case adventitious, and it may be that we shall find them at times the cause of infection.

The organism most prominent in the smear is the one most likely to be a factor in the etiology of the infection. Whether in any particular case, however, it actually represents the infecting agent is by no means certain. In some cases it probably does not—*e. g.*, trachoma. In corneal infections or focal staphylococcus infection of the conjunctiva (phlyctenular conjunctivitis), conjunctival discharge, if present, usually means general conjunctival infection in addition to the focal process, and the germs found in this discharge are therefore related rather to the general than to the focal infection. If the focal process, however, were secondary, there is a presumption that the infection came by way of the conjunctival discharge. On the other hand, the evidence in the majority of cases, especially of conjunctivitis, while perhaps not conclusive, so far as it goes, indicates that the prominent organism is the infecting organism. When

we find streptococci alone in shreds of a sloughing cornea, or gonococci in a purulent conjunctivitis, we can be fairly sure upon this point. It is the very mild infections, where the only organisms present are those supposed to be harmless, upon which we need more light.

Enough evidence has, I think, accumulated to warrant the placing of conjunctivitis at least upon a bacteriological basis of classification, and to afford strong indications that there may be the same basis for treatment. That there are still some exceptions to be explained in adopting such a basis argues rather gaps in our knowledge than any inherent error in the idea. Such a classification has been tentatively followed in describing the present hundred cases.

As to a bacteriological basis of treatment, the knowledge of just what germ we have to deal with, of its habits and its possibilities, in addition to the knowledge not always otherwise appreciated, that we are dealing with a germ process, affects our methods in the mild as well as in the severe cases. In the selective use of remedies based on the kind of organism present, we have much to learn. The value of zinc chloride in diplobacillus infection, of antitoxin in Klebs-Loeffler infection, and of mercury in focal infection with the staphylococcus, are settled facts of therapeusis. Antipneumococcic serum in such pneumococcus infections as serpent ulcer, and antistreptococcic serum in streptococcus necrosis of the cornea and panophthalmitis, have as yet only a theoretical value, but they would seem worthy of trial. Vaseline remains with us one of the most valuable remedies in both conjunctival and corneal infection. Whether it acts by limiting the supply of oxygen, or by mechanically separating the conjunctival surfaces and mixing with the germ-laden discharge helps to dilute and remove it, or by protecting sound tissue from invasion, or in some other way, we do not know. While any approach to the poultice is uniformly bad, hot water for short periods is useful in any infective process. Some silver salts are also useful. In the multitude of new things, we occasionally find some drug or method of real merit, but we are constantly learning what not to use, and what not to do. And the more we know

about infection, the more we appreciate the importance of mechanical cleanliness and the importance of gentleness in all manipulations about the eye.

There are some indications that our ideas about pathogenesis may need revision. Which organisms are pathogenic and which are not, on a basis of human eye infection? May organisms usually non-pathogenic become pathogenic upon occasion? What is the rôle of non-pathogenic organisms in the eye? For while in many cases the relation between germ life and pathological processes seems pretty definitely established, in others, where germs are few or not ordinarily pathogenic, we do not know and can only record observations, and wait for more cases and more facts.

A CASE OF MULTIPLE CYST FORMATION OF BOTH LOWER FORNIX FOLDS.

By Dr. ACKERMANN, Halle.

Translated from the German Edition, Vol. XLVI., by Dr. Percy Fridenberg, New York.

(*With three figures on appended Plates IV. and V.*)

In the sixth session of the Halle Medical Society, Schmidt-Rimpler presented a patient with several cysts of both lower fornix folds, with a microscopic specimen of a similar cyst which had been excised. He was of the opinion that he had to deal with a cystic degeneration of Krause's glands. Considering the rarity of publications on this subject, and the fact that so extensive a cyst formation as this has not yet been described, further microscopic examination and a more detailed consideration of the question presented seem to be in place.

Cysts of the conjunctiva have been observed and described only since a comparatively short time. In the first edition of the Gräfe-Saemisch hand-book, Saemisch mentions only cysts of the bulbar conjunctiva and calls attention to their rarity. Later on, other cysts of the conjunctiva, more especially those of the fornix folds and of the tarsus, were observed; the first by Laqueur in 1877, and soon after by Makroki, Moauro, Rampoldi, and others. The second form, affecting the tarsal conjunctiva, was first described by Vossius, in 1896, and after him by de Beck, Goy, Wintersteiner, and others.

The more frequent subconjunctival cysticercus cysts, which according to Ballaban amount to $\frac{1}{6}$ of all cysticercus

cases, the dermoid cysts of the conjunctiva, the lymphangiectases of the bulbar conjunctiva, and the small cysts which in rare cases are seen at the tip of a pterygium, shall not be considered here.

The mode of development of the above mentioned subconjunctival cysts presents considerable difficulty, which has been overcome only quite recently. On the other hand, they are of particular interest, being characterized, as Ischreyt very correctly observes, by unobstructed growth in consequence of the loose tissue in which they lie, and relative freedom from secondary changes; they are thus differentiated from almost all other cysts.

If we are not satisfied with the view of Hache, that cysts may develop from simple serous exudation into the spaces of the subconjunctival tissue, a view which certainly would explain any kind and position of cysts, we must come to the conclusion which corresponds to the investigations of the last few years: that there is no uniform cause of development, and that their formation depends upon structural changes, whether normal or pathological, in the various component parts of the conjunctiva. As a point of origin for the formation of the cysts, we have to consider, first, the glands of the normal conjunctiva, and, second, the pathologically changed epithelium of the conjunctiva. In regard to the first category, the human conjunctiva presents the following forms: (1) the Meibomian glands of the lid margin; (2) the modified conglomerate sweat glands of the same region; (3) the acino-tubulous glands of Krause; and finally (4) the so-called Henle's glands which, as Steida and Sattler have found by horizontal sections, are not real glands, but rather epithelial invaginations of a short tubular form, which, however, have a muciparous character, and, hence, glandular function (Waldeyer).

The glands of Manz at the corneal margin, which Stromeyer claims to have found in the new-born, are found only in certain animals (pigs and goats), and not in human beings. On the other hand, where the semilunar fold is unusually well developed, we sometimes find under it a group of glandular tubes which correspond to the Harderian gland of mammals.

In regard to the participation of the various glandular structures in the anomaly to be considered by us, the most important are Krause's glands: those, first, situated, to the number of forty-two, in the upper fornix fold, and, second, those in the lower. They are found at the outer and inner canthus, but mainly at the inner, contrary to Kleinschmidt's statement, and lie in or beneath the conjunctiva, becoming less numerous toward the edge of the tarsus.

The gland body is comparatively large and is composed of round, tubular loculi with a number of round, berry-like extensions. The loculi are quite large, and filled with clear epithelial cells of considerable size. The interstitial tissue is not different from that of other acinous glands. According to Wolfring, similar glands are found in the tarsus between the ends of the Meibomian glands and the beginning of the levator palpebræ. Wolfring has shown that these glands take an active part in affections of the conjunctiva: by infiltration and epithelial changes in acute blennorrhœa and hypertrophic catarrh, as well as by atrophy and anomalies of secretion after chronic blennorrhœa and diphtheritic conjunctivitis. Ischreyt points out that these glands might well play a part in trachoma—for instance, in the secretory disturbances which are found in the later stages of this affection. At all events, it is well known that these glands have a marked tendency to participate in conjunctival affections, so that we may conclude that they would be extremely active in the formation of cysts. How far this holds true for the case previously reported will be shown below.

As structures concerned in the formation of cysts we must also consider Henle's glands, the importance of which was first shown by Ginsberg. It is his opinion that the origin of cysts from Krause's glands lacks proof, and he considers Henle's glands the point of origin by a closing-off of the excretory ducts from inflammations and secondary changes, thus forming retention cysts. As an analogy, Ginsberg calls attention to the development of glands in chronic catarrh of the conjunctiva in places where, normally, none is present; which may thus likewise lead to the

formation of cysts. This brings us to the second mode of origin of cysts, *i.e.*, pathological changes in the conjunctiva.

Iwanoff, and after him Berlin, first described peculiar epithelial invaginations of the conjunctiva in trachoma, presenting two varieties: 1st, simple epithelial invaginations with numerous beaker-cells surrounded by a fine network of capillaries; 2d, long tubular glands lined with two layers of epithelium, a deep layer of round cells and an upper one of cylindrical cells with a definite basal membrane, and a surrounding tissue thickly infiltrated with round cells. Iwanoff compares them to the Meibomian glands. Leber and Jacobson, however, have shown that these glands are found not only in trachoma but in every variety of conjunctivitis, and that they may even be found, in small numbers, in the normal conjunctiva. These epithelial invaginations, which have secretory functions, may undergo obstruction through marked tissue changes in consequence of chronic inflammation. This may be followed by a swelling of the gland, and finally by cystic metamorphosis. The walls of the epithelial lining become so changed by the pressure of the retained secretion that finally there is no resemblance whatsoever to the original picture. A number of other conjunctival cysts are to be explained in this way.

According to Ballaban, the rarest cysts are those of the lids; five cases have been reported, including those of de Beck, Vossius, Wintersteiner, and Goy. These develop from the lid glands or from Krause's glands, and are lined with laminated epithelium or with cylindrical epithelium. Glands of the fornix fold are most common (nineteen cases). They develop from Krause's glands. The most common glands are those of the bulbar conjunctiva (thirty-two cases). As glands are not normally found in this region the cause may be, first, ectatic lymphatics, or, second, invaginations of the epithelium, corresponding to Iwanoff's glands. My case is the following:

Frederick B., aged fifty-six, came to the clinic on June 18, 1901, complaining of tearing and burning in both eyes. Examination showed a slight ectropion of the otherwise normal lower lid of both eyes. The inner lid margin was slightly separated from

the globe. The tarsal conjunctiva, and, slightly, the palpebral conjunctiva showed inflammatory injection. On turning the upper lid no traces of trachoma were found. In the lower fornix fold a number of transparent protrusions were seen, resembling a string of pearls. They were about $4\frac{1}{2}mm$ from the caruncle, $3\frac{1}{2}mm$ from the lid margin, and about $7\frac{1}{2}mm$ from the lower corneal margin. Besides the larger agglomeration, consisting of about six small cysts from hemp-seed to lentil size, there were a number of single small cysts outward and downward, numbering ten in all. The largest cysts measured about $3mm$ in diameter; the smallest were about the size of a pin's head. The conditions in the left eye were exactly the same. The patient did not know how long this affection had existed, but his statements made it probable that it had been present for about two years. For purposes of examination, two of the larger cysts of the left eye were removed with scissors, and examined fresh as well as after hardening. Sections of the fresh material showed that the cyst sac was composed of firm fibrillary connective tissue lined with flat epithelial cells. The contents were a colorless fluid of normal reaction, containing numerous desquamated and partially fatty epithelial cells, with a few leucocytes, and amorphous detritus, in which the hydrochloric-acid test showed granules of carbonate of calcium. The other cyst was fixed in formol, hardened in alcohol, and presented a picture corresponding exactly with that to be described farther on. This finding, with the demonstration of the patient, was reported by Schmidt-Rimpler, as stated at the beginning of this article.

On July 4th the remaining cysts were excised with scissors and forceps, and the wound closed by two sutures. Healing took place by first intention.

The portion excised from the right eye measured $2\frac{1}{2}cm$ by $1\frac{1}{2}cm$. Sections were stained with hæmalum-eosin, Bismarck-brown, and van Gieson's stain. These sections presented the picture of an extensive cyst-formation in the subconjunctival tissue, the largest measuring $1mm$ in diameter, the smallest 50 to 60 micro-millimetres; forming a convolute separated by thin, winding walls. A few cysts of varying size lay scattered in the tissue without any connection with the principal mass.

The conjunctival epithelium was very irregular, and, as

a whole, much thinned, so that only two or three cell layers could be distinguished; but here and there, particularly in the folds of the conjunctiva, there was marked thickening. At these points an extraordinary development of beaker-cells attracted attention. The latter appeared as large cylindrical and cubical cells filled with a transparent, finely granular mass which stained but faintly with eosin. The nuclei were long, and lay close to the cell wall. Staining with Bismarck-brown showed very clearly the oval aperture of the peripheral end of the beaker-cells. The remaining cells were cuboidal or flat, and lay irregularly near and over one another. Between and upon the epithelial cells leucocytes with fragmented or multiple nuclei could be seen: secretory cells which were about to migrate through the epithelium. The loose subepithelial tissue of adenoid character showed a decided proliferation of round cells, whose compact mass took on at one point the formation of a definite follicle. The layer below this, composed of rather thick fibrillary connective tissue, also showed an increase of nuclei, with many capillaries and dilated lymph vessels. In this layer lay the cysts, projecting at some points into the layer above, and reaching almost to the surface. Around these cysts there were found several circumscribed collections of lymph cells, which, however, could not be compared to follicles either in regard to their structure or their rather vague boundaries. In the neighborhood of the cyst walls the rather irregular, connective-tissue fibrils assumed a somewhat parallel course with more regular arrangement. Although no sharp boundary was present, two layers could be distinguished; one, peripheric, in which the fibres were wide-meshed, coarser, and poor in nuclei; and another, central, in which the fibres were closer arranged, fine, and provided with numerous fusiform nuclei. The true *stratum propium* was lacking. The epithelium showed great variability, according to the size of the cysts. Cross-section of the largest cysts showed a double layer: first, a parietal layer of extremely flat cells with long nuclei, which stained deeply with hæmalum; and second, a layer of higher, almost cuboidal, cells with oval nuclei which were more faintly stained.

Among the latter were found, even in the largest cysts, some cells which had undergone mucoid degeneration. The cysts of medium size showed epithelium of at least two layers and often more (oblique section ?, epithelial proliferation ?). Here the cells were higher, the nuclei lay at various levels, and the degenerated cells were more numerous. In the smallest cysts, finally, the superficial layer was composed of almost cylindrical cells, the lowest cuboidal, with flat cells directly against the cyst wall. In these cysts the mucoid degeneration was most extensive. The neighboring walls of large cysts were in many places so thin that the epithelial layers almost came into contact with one another. The contents of most of the cysts had fallen out, but in a few there was found granular detritus, containing a few desquamated fatty epithelia with occasional round plates staining intensely with eosin—probably cell remnants. In other cysts there were found only filaments or granules of albuminoid coagula. From the surface of the conjunctival epithelium numerous epithelial tubes dip into the tissue beneath, partly as solid prolongations, partly presenting a lumen of a glandular character. These structures were characterized by their epithelium, which corresponded exactly to that of the conjunctiva, by the beaker cells, and by the absence of a membrana propria, as analogous with the class of simple epithelial inclusions described by Iwanoff. Gland remnants, acini, excretory ducts, and so forth, could not be found.

In regard to the mode of origin of these cysts, the history, clinical picture, and microscopic findings combined, allow us to exclude a series of varieties. The cysts had developed in a comparatively short time, without previous traumatism, so that we may exclude congenital anomalies, cystic degeneration of hemorrhagic exudates, and the like. There remain the possibilities of a development from the Krauserian glands, or from cystic degeneration of epithelial invagination on the basis of a chronic catarrh. Even a superficial study of the literature shows how little the two varieties differ in location, size, and contents. In some, the mode of origin was by no means definitely ascertained. As

to the possibility of development from Krauserian glands, this hypothesis is not contradicted by the epithelial lining of our cysts, nor by their position; for although Ginsberg claims that Krauserian glands are never found in this locality, his statement has been contradicted by the findings, already cited, of Kleinschmidt, Waldeyer, and Krause. There remains as a single factor of uncertainty the absence of all gland branches; a finding which certifies to the origin of many cysts developing from Krause's glands (Ischreyt, Moauro, and Wintersteiner). We must remember, however, that cases of Krauserian cysts of undoubted authenticity were lacking in this secondary finding, and Wolfring's publications have shown how extensively the Krauserian glands are concerned, in conjunctival affections, with degeneration, atrophy, and so forth. It may well be imagined that, beside the cystic enlargement of the greater part of the acini, the remaining portions, together with the excretory ducts, had become atrophic and had disappeared entirely, particularly as such an atrophy of the excretory ducts must be taken for granted if we wish to explain the cyst formation at all. The occurrence of few and small Krauserian glands in this part of the conjunctiva seems to uphold this view, for the few remaining acini of a small gland can only exist as degenerated remnants after so many of these acini have become cystic. As a proof that a chronic inflammatory process had been active in the conjunctiva we have, in addition to the clinical history, the anatomical picture itself, namely: (1) the marked increase in round cells, amounting in places almost to the formation of follicles; (2) the frequent occurrence of beaker-cells; (3) numerous epithelial inclusions, whose multiplicity can only be explained by long-continued pathological irritation. We may thus explain the histogenesis of these cysts by an occlusion and degeneration of the excretory gland ducts in consequence of a chronic inflammation. The retained secretion widened the lumen, and, besides increasing the volume of the cysts thus produced, caused such marked flattening and deformation of the lining epithelium that the latter lost all similarity with its original form, just as has been seen in

other cysts formed by retention in glands. A clear picture of this process is presented when we compare the small and large cysts.

The finding of numerous epithelial inclusions requires the consideration of every possibility of origin of these cysts. The size and location of the cysts, their epithelial lining, and so forth, are quite in accord; and the finding of numerous beaker-cells in the small cysts would speak in favor of this view, but the lack of connection of the cysts with the epithelial tubes, which is invariable in all cysts developing in this way, forces us to give up this explanation. The finding of very many small young cysts whose lumen had only just been widened should show such a connection; for the obliterated epithelial tube connecting the gland with the surface would hardly have disappeared entirely in so short a time. This lack of any connection appears to me decisive, and makes certain the origin of these cysts from a Krauserian gland, as was originally supposed.

Explanation of the Figures.

1. Macroscopic picture of the cysts of the right eye.

2. Section through the cysts; low power (Zeiss, Objective A. Ocular Number 2). *a*, cysts; *b*, desquamated epithelium; *c*, epithelial inclusion; *d*, detritus.

3. The same; high power (Zeiss, Objective D. Ocular Number 2). *a*, small cyst; *b*, large cyst; *c*, interstitial tissue with round cells; *d*, epithelial lining of a large cyst; *e*, cystic cells.

ABSTRACTS OF ARTICLES IN VOL. XL. OF THE GERMAN EDITION, NOT PREVIOUSLY PUBLISHED.

By Dr. MATTHIAS LANCKTON FOSTER, New York.

I.—Trachoma.

By Dr. **LEOPOLD MÜLLER**, Vienna.

MÜLLER states that in 23 out of 63 cases of trachoma he found the bacillus which he had previously described as characteristic of trachoma[1] sometimes in pure cultures, sometimes in numerous colonies, but only twice in single colonies, by culture in plates of blood agar. This article is principally an argument that the bacillus referred to is characteristic and pathognomonic of trachoma and distinct from the influenza bacillus. This subject has more recently been elucidated in these Archives, vol. xxxiii., No. 5, by Dr. Arnold Knapp, to whose article the reader is referred.

II.—A Congenital Anomaly of the Sclero-Conjunctiva and the Cornea.

By Dr. **FRANCESCO FALCHI**, Pavia.

A girl, six months old, presented a congenital tumor, shaped like two laterally united clover leaves on the right eye. It extended from the outer canthus over the outer part of the cornea, covered thus the outer third of the anterior surface of the globe, and corresponded to the outer half of the palpebral

[1] *Wiener klinische Wochenschrift*, 1897, pages 920 and 955.

fissure which was kept open. It was smooth, of a rosy red color, adherent to both the cornea and sclera. Its length was 14*mm;* its greatest breadth, near the corneo-scleral margin, 10.05*mm;* its thickness over the sclera 1*mm*, over the cornea 0.5*mm*. The eyes were otherwise normal. The tumor was removed and found to consist of elements of the retrotarsal folds with glands, vessels, and goblet cells.

III.—Additional Contributions to the Anatomy of Myopic Eyes.

By Dr. **L. HEINE**, Breslau.

In 1897 Heine published the results of his microscopic examination of three myopic eyes, and furnishes in this article the results of the examination of three additional eyes. In all six he found a very marked suppression of the elastic lamina of the choroid, which causes the peculiar distortions that lead to conus formation. This lamina does not stretch proportionately with the sclera, choroid, and retina, and the resistance encountered suffices to produce great distortion of the nerve fibres and atrophy of the choroid. On the nasal side of the papilla, the resistance of the elastic lamina to the force which here causes supertraction may be so great as to distort the nerve fibres in a contrary direction to that of the supertraction. Hence he considers that the signs of distortion found in myopic eyes at the entrance of the optic nerve are due to the difference in the condition of the sclera, choroid, and retina on the one hand, and of the elastic lamina on the other, as opposed to the force which causes distention of the posterior section of the eyeball, and that this difference is the occasion of the formation of conus. Retraction of the elastic lamina and conus formation go hand in hand. He also believes, from the results of his examinations, that in the formation of a pure "simple conus without choroidal atrophy" there is an atrophy of the choroid from pressure or distortion in the region of the conus. The choroid may be partly present in the region of the conus, so that the latter may appear ophthalmoscopically pigmented in places, or this appearance may occasionally be

ascribed to scleral pigmentation even when the choroid is completely atrophied. He could not find a case in which the choroidal atrophy extended beyond the retraction of the elastic lamina, though he acknowledges that such an occurrence is possible. When the elastic lamina yields equally with the sclera and retina, no conus is formed. Such a condition is mainly found on the nasal side of the nerve, but it is not certain that the elastic lamina is least yielding, and the sclera and retina most so, on the temporal side of the papilla. The condition probably depends on the direction in which the intraocular pressure acts to stretch the tunics of the eye. Usually this coincides with the symmetrical axis of the eye, or corresponds perhaps to the middle resultant from the tension of the extrinsic muscles, in which case the posterior pole must undergo the greatest degree of stretching, and there, in so far as the elastic lamina does not yield, the greatest distortion of nerve fibres must be produced. When the optic nerve enters in the middle of the ectatic portion—*i. e.*, near the posterior pole, a ring-shaped conus will be formed. It still remains to be learned whether the elastic lamina is everywhere affected equally in myopia, or whether it is more yielding on one side than on the other. In this connection it is of theoretical interest that one may find the supertraction above and a typical conus developed below. In one eye with fourteen dioptries of myopia the circumfoveal walls were flattened so as to bring the fovea almost on a level with the rest of the retina. The retinal epithelium was absent in the centre of the fovea, degenerated about the centre, and normal outside of this region.

IV. — The Operative Treatment of Complicated Cataract.

By Dr. **G. GUTTMANN**, Berlin.

Cataracts may be complicated by diseases of the eyeball itself or of its adnexa. Cataracts complicated by diseases of the eyeball may be divided into two groups: first, those in which the cataract is of the usual form, color, and con-

sistence, while the result of the operation is impaired by the presence of corneal opacities or optic atrophy; second, those in which the cataract is caused, or at least preceded, by retinal, choroidal, or uveal disease with changes in the vitreous. The last group contains the forms of complicated cataract with which Guttmann deals in this paper. During the past eleven years he has operated on forty-five such cataracts in thirty-eight individuals. In seven patients a complicated cataract was removed from each eye. In five the other eye was blind. Of the remaining twenty-six, five had nearly normal vision in the other eye, three were operated on for cosmetic reasons, two on account of increased tension. The vision of the other eye in the remaining twenty-one was more or less reduced. In fourteen eyes the cataract was complicated by excessive myopia with chorio-retinitis atrophicans circumpapillaris et centralis with fluid vitreous, in two by optic atrophy of retinal origin, in seven by retinal detachment. In ten eyes the cataracts were shrunken, five with circular posterior synechiæ, four with more or less adhesion to the iris, and one a tremulous cretaceous cataract with secondary glaucoma. In two there was irido-choroiditis with anterior and posterior polar cataract, posterior synechiæ, and central capsular cataract; in one, the results of sympathetic ophthalmia. In two cases there was a diffuse corneal opacity and posterior synechiæ; in one, a progressive lamellar cataract. In the two eyes of one patient there was central senile retinitis, with congenital amblyopia in one. Another case had scleritis. Two eyes had disseminated choroiditis and two pigmented retinitis. The results obtained by operation on these forty-five eyes were thirty-eight improved, the vision obtained ranging from $\frac{1}{200}$ to 1, six unimproved, and five made worse.

V.—A Case of Lead Amblyopia.

By Dr. **WINFRIED BIHLER**, Freiburg.

B. O., compositor, thirty-nine years old. Mother died of lung disease, brothers and sisters healthy. Always well until an attack of extensor paralysis of his right arm twelve years ago,

which gradually disappeared under treatment with potassic iodide and the faradic current. After that he suffered repeatedly from lead colic. June 4, 1899, while under treatment for tuberculosis of the right lung, he noticed a disturbance of the vision of each eye which soon disappeared spontaneously from the left. With the right eye he continued to see only on the nasal side. No headache, vomiting, or dizziness.

Condition June 21, 1899: Small, spare man, with a good brown complexion. Well marked blue line and slight gingivitis. Tuberculous lesion at apex of right lung. Muscles of right arm less developed than those of left. No paresis, but some reduction of strength. Urine normal. Vision of each eye $\frac{6}{6}$. Reads the finest type.

Nasal half of left field lost except for a small angular space in the lower part near the point of fixation. The fields for colors correspond to that for white. Of the field of the right eye only the lower quadrant of the temporal side is wanting for white, while the color fields correspond to those of the left eye. In each eye the fixation point remains in the retained portion of the field. This complete hemi-achromatopsia with partial hemianopsia was demonstrated repeatedly with the perimeter.

Both eyes were outwardly normal, and the motility was good except for a slight nystagmus when the eyes were turned extremely to one side. The pupils were equal, small, and reacted promptly. The media were clear, the fundus distinct. The papillæ were well colored; there were no changes in the vessel walls, but the veins were somewhat overfull and were tortuous in places.

Under treatment with potassic iodide the angular space in the nasal side of the left field grew larger, while the defect in the lower quadrant of the right field became small. No change took place in the fields for colors; the homonymous right-sided hemiachromatopsia persisted.

VI.—What Causes Ring Scotoma.

By Dr. **ARTHUR CRZELLITZER**, Strassburg.

Crzellitzer describes twelve cases, each with a ring scotoma, some complete, others partial, all concentric. The fundus conditions were manifold, and possessed only one point in common, that there was nothing to be seen in the retinal

zone corresponding to the scotoma to explain its presence. His conclusions are that every process which produces a local increase in volume within the tunics of the eye, every transudate, detachment, hemorrhage, or exudate, will tend to spread in parallel circles, or in a ring, so long as the *vis a tergo* is not greater than the existing difference in tension. On this basis he founds an explanation of the presence of the ring scotoma in each of his cases.

VII.—Cystadenoma Papillare Proliferum of Moll's Glands.

By Dr. **HUGO WINTERSTEINER**, Vienna.

A man, thirty-one years old, had a transparent cyst, as large as a cherry-pit, near the lower punctum of the left eye, which protruded upward and forward from the anterior edge of the lid. It had existed four years, and grew slowly, with no sign of inflammation until opened at the end of two years, when more rapid growth ensued. It was diagnosed as a cyst of Moll's gland, and excised. The diagnosis was confirmed by the histological examination. The deviation from the condition usually found was in an epithelial proliferation, which greatly resembled the tumor formations found in ovarian cysts. This suggested the name given it in the title.

VIII.—Contribution to the Refraction of the Eye.

By Dr. **K. von BRUDZEWSKI**, Paris.

This highly technical paper deals principally with the question of spherical aberration. First the refraction of the cornea, particularly of its periphery, is studied, then its spherical aberration, which is stated to be almost always positive, negative aberration forming rather an exception. Then the spherical aberration of the eye as a whole is considered. The subject is thoroughly developed with formulæ, tables, and illustrations, but the paper is one which it is very difficult to satisfactorily abridge. It will be better for any one interested to read the original article.

IX.—Irrigation of the Lachrymal Passages through the Puncta.

By Dr. **OTTO NEUSTAETTER**, Munich.

In a certain class of cases with trouble in the lachrymal passage, simple cleansing without slitting the canaliculus is all that is necessary to effect a cure. To do this the author uses a syringe with a canula sufficiently small to permit of its introduction into the canaliculus. When the canula has been introduced, the operator feels at once when he uses the syringe whether the fluid passes into the canal or not. If it does not pass, two possibilities are to be thought of, closure of the passage and faulty technique. The technique may be faulty in several ways: 1. The canula may slip from the punctum. This occurs very frequently, especially at first. 2. The position of the canula may be so oblique that the stream of water takes too nasal a direction. 3. Too firm pressure may be made on the canaliculus. 4. Pressure may be made with a finger on the canaliculus or on the lachrymal sac. 5. The fluid used may be unfitted for the purpose. A solution of boric acid will often pass where a 0.3 % solution of zinc sulphate will not.

The indications for irrigation in this manner are:

1. To investigate the conditions of the lachrymal passages.

2. Therapeutically for the treatment of cases of epiphora, in which complete stenosis has not been demonstrated by repeated syringings, such as acute and chronic catarrhal swellings of the canaliculi, of the sac, and of the bony canal, strictures in the canaliculi and elsewhere, atony and slight hydrops of the sac.

X.—The Annular Fibres of the Lenses of Birds.

By Dr. **C. RITTER**, Bremervoerde.

A careful study of the course of the lenticular fibres in birds.

XI.—A Case of Gyrate Atrophy of the Choroid and Retina, with Sclerosis of the Choroid.

By Dr. **ADAM BEDNARSKI**, Lemberg.

Man, twenty-three years old. Family history good. When about eight years old, was ill for several weeks with a disease in

which the face was so swollen that the eyes could not be seen. An older brother died at this time of the same disease. Since recovery, vision has never been as good as before, particularly in the evening. Four years ago he was sick again, and lay unconscious for three days, but this sickness was not followed by a decrease in vision. At his first examination for military service, in his twenty-first year, and also on his second examination, he saw well during the day. During the spring of the present year his vision began to fail in the daytime. Four months ago there was a great loss of vision. No history of syphilis, or of abuse of alcohol or tobacco.

Right eye: Refractive media clear. Papilla reddish gray, rather paler than normal; margins well defined. Veins somewhat, arteries much, smaller than normal. Superior temporal, superior nasal, and inferior temporal arteries bordered with gray. The gray border of the inferior temporal artery extended half a papillary diameter beyond the papilla. The veins were free to the place where the superior temporal artery crossed the superior temporal vein, but from that point the vein received the gray border for a distance of $1\frac{1}{2}mm$ (upright image). The fundus could be divided into three zones. About the papilla was the zone of atrophic choroid, 1 to $1\frac{1}{2}$ papillary diameters broad; farther toward the periphery was the zone of sclerotic choroid, 2 to 3 p. d. broad; and still more to the periphery was the third zone of normal appearance. There was nowhere a sharp line of demarkation between the zones. No choroidal vessels could be seen in the first zone, except here and there an indistinct trace in the form of white lines, which were certainly remains of choroidal vessels. The background was white, rather darkly pigmented. The second zone was in general much darker than the first, with straight or slightly curved white cords, which here and there contained a very thin, pale blood column, interrupted in places. In some places a white sheath could be seen on one side of the blood columns. These sclerotic changes of the choroidal blood-vessels were most marked above and to the inner side. Above and to the outer side the vessels were without borders, and could be distinguished from the normal only by their straighter course and their paleness. The neighborhood of the macula lutea was dark red, nearly normal, with no blood-vessels visible. Upward and inward in this zone there were small black spots which covered the vessels. In the third zone

and in the peripheric part of the second there were spindle-shaped islands, dark brick-red, of indistinct granular structure, usually triangular, and all with concave sides. These islands were connected by threads, so as to form a network. Their margins were distinct. The retinal vessels passed over, the choroidal vessels beneath, them. Black choroidal spots were visible in both the peripheral and the second zone.

In the left eye the changes were similar, but less marked, especially with regard to the arteriosclerosis.

The vision was $\frac{5}{15}$ with correction. The fields were cut, as in optic atrophy, and there was a circular scotoma between 20° and 60°, the borders of which were not perfectly defined. The light sense was much reduced, and the color vision was bad.

After treatment for two months and a half, the fundus showed very little if any change, but the central and peripheral vision, as well as the light sense, were better.

REPORT OF MEETINGS OF THE OPHTHALMOLOGICAL SECTION OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. H. W. WOOTTON, Secretary.

MONDAY, MARCH 20, 1905. PRESIDENT, DR. WILBUR B. MARPLE, IN THE CHAIR.

Dr. Robert G. Reese presented a case of **pearl-cyst of the iris,** due to the implantation of a cilium in the anterior chamber.

Two years ago the patient was struck in the eye with a sharp instrument and six months later applied for treatment. Dr. Reese made a corneal section and removed the cilium; he found the cyst adherent to the lens capsule. He then took out a piece of the iris each side of the cyst and curetted its contents. Within the past six months the cyst has become larger; the eye has been perfectly quiet since the operation. Dr. Reese intended to remove the cyst and lens.

Dr. J. E. Weeks presented a patient from whose orbit he had removed a large **endothelio-cylindroma, with preservation of the vision and of the motility of the eye.** The patient, a woman aged thirty-two years, first noticed something wrong with the left eye ten or eleven months previously. When seen, the left eye protruded downward, forward, and outward. About two-thirds of the cornea only could be covered on forcible attempts to close the eye. A hard mass was felt protruding a little beyond the upper margin of the orbit. The patient was admitted to the New York Eye and Ear Infirmary and operated upon under ether. An incision was made along the lower margin of the brow, extending the full length of the brow. The septum orbitale was exposed at the margin of the orbit and divided, when the tumor presented. It was found that by blunt

dissection the tumor could be separated from the orbital plate of the frontal bone and from the orbital tissue. The supra-orbital nerve and the levator palpebræ superioris were included in the tumor and were necessarily divided. The tumor was removed intact. It was apparently completely encapsulated. The orbital plate of the frontal bone was eroded, but not perforated. After removal, the cavity was carefully sterilized, the margins of the septum orbitale were united by catgut sutures, and the cutaneous wound closed. Healing took place by first intention. The tumor measured 38*mm* in its antero-posterior diameter, 34*mm* in its transverse diameter, and 30*mm* in its vertical diameter. On microscopical examination the growth proved to be an endotheliocylindroma.

Dr. H. H. Seabrook thought that the ptosis which had resulted from the operation performed by Dr. Weeks rendered the preservation of vision in this case more theoretical than practical.

Dr. W. E. Lambert thought that Dr. Weeks was to be greatly congratulated in the result that he had obtained, and thought that the ptosis could be overcome later.

Dr. Weeks thought that when we could preserve the eyeball even when covered by the upper lid, as it was in this case, the eyeball could be uncovered later. He thought that in this case the operation of Panas was to be recommended. Hugo Wolff's operation was obviously contraindicated, for the ptosis had resulted from section of the levator, and the action of some other muscle would, therefore, have to be substituted for it. The changes in the fundus were almost the same as before the operation; the arteries were still small and the veins large but not tortuous. Endotheliomata of the orbit were, as a rule, encapsulated, and if they recurred at all, recurred very slowly. The prognosis was much better than in the case of sarcoma and carcinoma.

Dr. Claiborne stated that in Dr. Weeks's case the upward movements of the eye were limited, and as it had been stated that diplopia was absent, this absence might be temporarily due to the impaired vision.

Dr. Weeks replied that there might be diplopia in the extreme upper part of the field, but that none existed in the horizontal plane or near the horizontal plane.

Dr. J. A. Davis wished to know whether a binocular single vision was present. It would seem impossible that it should be

with a faulty fixation, and diplopia must certainly exist in the upper part of the field unless the patient suppressed one of the images.

Dr. WEEKS stated that diplopia could be produced by prisms.

Dr. M. L. FOSTER gave the history of a case of ptosis upon which he had operated by the method of Hugo Wolff. The operation was performed in the usual manner and the result had been excellent.

Dr. E. L. MEIERHOF presented a case in which the performance of Bowman's operation had left a greatly widened canaliculus, the anterior wall being permanently separated from the posterior.

Dr. WEEKS thought that the deformity was probably due to a cicatricial contraction following suppuration.

Dr. MEIERHOF thought the condition could be partially improved by denuding the mucous membrane and uniting it by sutures.

Dr. E. L. OATMAN exhibited a pair of **scissors designed to cut thick secondary membranous cataracts.**

They were small straight scissors with one blunt and one pointed blade. The latter had a knife edge ground on the back for a distance of *4mm* from the point. To operate, open the cornea with a keratome. Pass the closed points of the scissors into the anterior chamber, with the cutting blade below. Open the blades, and the lower, with its sharp point and knife-edged back, perforates the membrane. Pass the blades forwards and cut.

Dr. E. L. OATMAN read a paper on **cysts of the pars iridica retinæ.** Published in full in these ARCHIVES, vol. xxxiv., No. 3, p. 252.

Dr. J. H. CLAIBORNE asked if Dr. Oatman's scissors could be successfully used with a round pupil.

Dr. OATMAN had only used them after an iridectomy had been performed.

Dr. CLAIBORNE stated that some years ago for the same purpose he had devised a sort of Tyrell's hook sharpened on the inner side.

Dr. W. E. LAMBERT used the de Wecker's scissors and liked them very much, and he could not see how Dr. Oatman's could be as efficacious. He also thought that more vitreous would be lost with Dr. Oatman's scissors because of the larger corneal opening which was necessary for their use.

Dr. F. N. LEWIS thought the instrument had practically been

described before. He had a pair of scissors like them, which differed only in the fact that the handles were different.

Dr. H. H. SEABROOK thought that Noyes's scissors were very similar.

Dr. OATMAN stated that he had found the de Wecker scissors rather awkward to use. The lower blade of his own had a knife on the back as well as a sharp point. He liked an instrument that cut when the operator closed it.

Dr. ALEXANDER DUANE read a paper on **unilateral and other forms of nystagmus.** He described four forms, viz.:

1. *Circumduction nystagmus* in which the centre of the cornea moves round and round in a circular or elliptical path. This differs obviously from a rotary nystagmus, in which the cornea rotates about its centre, the latter being fixed. Circumduction nystagmus occurs in spasmus nutans and miner's nystagmus.

2. *Disjunctive nystagmus* in which the two eyes move not in parallel directions, but alternately to and away from each other. The movements are symmetrical and equal in the two eyes. Two forms are described: (*a*) alternate converging and diverging movements, occurring in spasmus nutans and sometimes as a result of eye-strain; and (*b*) convergent or divergent rotary nystagmus. Of the second form he gives one instance.

3. *Dissociated nystagmus.* In this the movements of the two eyes are unsymmetrical in direction, or are unequal in rhythm or extent. This occurs in spasmus nutans, in unilateral nystagmus which has become bilateral, and in other conditions. The author gives two cases, in only one of which, however, the dissociation was apparent.

4. *Unilateral nystagmus.* This is only a variety of dissociated nystagmus into which, indeed, it often passes. Four cases are described and the statistics of fifty-one given. Of these thirty-four were vertical, eleven horizontal, five rotary, and two mixed. Unilateral nystagmus is usually associated with a troublesome sense of apparent movement of objects looked at. It occurs as (*A*) an infantile condition in (*a*) spasmus nutans, and (*b*) unilateral opacity of the media; (*B*) in later life from (*a*) unilateral amblyopia and squint, (*b*) unilateral opacity of the media, (*c*) unilateral astigmatism, (*d*) nervous disease, especially multiple sclerosis. It is usually associated with squint and often with paresis or insufficiency of the eye muscles.

The author believes that unilateral differs in no essential way

from bilateral nystagmus, but represents simply a form of the latter modified by special conditions. Nystagmus, in fact, whether unilateral or bilateral, seems due primarily to a disturbance of the centres of co-ordinate movement. This disturbance may be (*a*) *centrifugal*, being set up by disease or irritation of the brain, (*b*) *centripetal*, set up by some cause (high-grade astigmatism, opacity of the media, albinism, defective illumination) producing blurred vision especially in early life (*optical nystagmus*).

In unilateral nystagmus, the conditions are such that the primary exciting causes (brain disease, defective sight) act predominantly on one eye, or there is a contributing cause—a muscular anomaly—which, being mainly confined to one eye, makes that eye respond more readily than its fellow to the abnormal stimuli set up by the primary cause.

Dr. A. E. Davis had seen one case of voluntary nystagmus in a child. Ordinarily there was no nystagmus, but looking at the near point rapid lateral nystagmus developed.

Dr. Charles Herrman had for some time been interested in that form of nystagmus in infants which is associated with movements of the head, the so-called spasmus nutans. A few years ago he had seen a large number of such cases. The patients came from a densely populated tenement district and lived in small poorly lighted rooms, under conditions favorable for the development of this disease. The patients were usually rachitic and presented themselves almost exclusively during December, January, and February ; that is, in the same months in which we see cases of spasmus glottidis, tetany, which are also frequently associated with rachitis. A fall has been considered by some (Heasch and Peterson) as an important etiological factor, but it is more likely this is the effect of the imperfect vision than the cause of the spasmus nutans. The movements of the head cease in sleep, and both the head movements and nystagmus are less pronounced on awakening than after some time has elapsed. The nystagmus movements can be produced, when not already present, by taking the child to the window. In other words, they occur when the child is exposed to light and when the object looked at is within a certain distance. Covering one or both eyes (depending upon whether nystagmus is present in one or both) caused cessation of the head movements. This was first demonstrated by Caillé. Nystagmus is frequently unilateral, or, if bi-

lateral, more marked in one eye, and as the case recovers it may disappear in one eye, so that it is apparently unilateral. It is often increased when the eyes are directed to the extreme right or left when the head is held.

The position of the head and eyes is peculiar. The head is cocked to one side as in torticollis, and the patient looks out of the corner of the eyes. It is highly probable that this position is assumed, because in it there is no nystagmus and no movement of the head. The dark room, as was first pointed out by Rodnitz, is undoubtedly an important factor in the etiology. He compares the condition to the nystagmus that occurs in miners. He had examined the homes of a dozen of these cases and had found that even when the family had a light room, the child was not in it, but either in a cradle placed in a very dark sleeping-room, or in the kitchen lighted artificially in winter. Rodnitz has performed some interesting experiments which tend to prove that the dark room is essentially a factor in the causation of the condition. He took four pups of the same litter; two were allowed to run about; these two showed no nystagmus. The other two were kept in a covered cage; at the end of nine weeks both exhibited nystagmus. One was then allowed to run about; all the nystagmus disappeared in three weeks to reappear in five days when allowed to return to the covered cage. When placed in the cage at seven weeks of age, they showed no nystagmus at the end of three months. This would tend to show that the age at which the effect of the darkness is allowed to act is important. It must be at a definite stage in the development of certain sets of associated fibres. This would explain why the condition is met with in infants at a certain age.

Dr. Francis Valk thought many cases, especially those that accompanied squint, were due to an insufficiency, and when a shortening or advancement of the externus was done, improvement was frequent; sometimes the improvement was very marked.

Dr. A. Coburn thought it unfortunate that Dr. Duane had not been able to photograph the movements. Dr. Coburn's apparatus could be used for this purpose.

Dr. Oatman stated that he had seen a case of purulent ophthalmia in a child of four months which resulted in perforation of the cornea. Later, marked nystagmus developed. After an iridectomy, which restored very good vision, the nystagmus disappeared in two weeks.

Dr. SEABROOK wished to hear more of what was known as to the causation and theory of nystagmus. Of course, the trouble was with co-ordination, but the local causes were certainly extremely interesting; for instance, corneal opacities in many cases, and the constrained upward position of the eyes in miners.

Dr. J. E. WEEKS thought that nystagmus might be classified under three heads: (*a*) Cases of cerebral origin. (*b*) Cases due to imperfect vision. (*c*) Those due to malposition of the eyes.

In regard to the cerebral cases, he mentioned that he had seen nystagmus produced by syringing the ear in a case of mastoid disease in which the dura had been exposed. Even for as long a period as seven years afterwards, by syringing the ear upon the operated side nystagmus was produced which would last for some hours.

The second class of cases was common, and the miner's nystagmus was to be attributed to this cause to some extent. Nystagmus was invariably present in albinos, frequent in opacities of the cornea, changes in macula, etc. In high myopia it was sometimes present after the glasses were taken off. In regard to the third class of cases, the vision is poor on account of the poor illumination, just as it is when there are opacities of the cornea or media. As to the cases due to muscular lesions, many could be placed in the second category.

Dr. MEIERHOF described a case of bilateral horizontal nystagmus following, within twenty-four hours, a dose of 120 grains of quinine. The patient was blind for a time, and, although some vision was recovered, it remained subnormal, and nystagmus developed.

Dr. SCHAPRINGER related the history of a case of nystagmus which existed in both eyes, but was more marked in one. When the child was brought from the dark into the light, it would hold its fist in front of one eye. The explanation, he thought, was that the vision being good, light striking the eye continuously had the same effect as if it did so intermittently—that is to say, it blinded the eye. The child always placed his fist in front of the eye with the greater degree of nystagmus. He thought this symptom had never before been noted.

Dr. DUANE stated that a lateral movement of the head could occur with a vertical nystagmus, so that the movement of the head was not compensatory. The nystagmus would then increase or decrease in certain positions of the head. He did not

believe that muscular errors, *per se*, were the determining cause in any case; some other condition must originate. Nystagmus could be caused by syringing the ear. The mere syringing of a normal ear had produced it. The main feature in miner's nystagmus was the poor illumination, the constrained position of the eyes doubtless contributing.

Dr. E. S. Thomson read a paper entitled **the advantages of transillumination, with demonstration of the Sachs lamp.**

Transillumination of the eye has recently been done by Sachs of Vienna and Rochon-Duvigneaud of Paris. He had been unable to find, so far, any papers on the subject. About one year ago, while removing an eye for sarcoma of the choroid, he found that by transillumination the growth could be distinctly seen, and since then he has repeatedly used the method. It is applicable only to the anterior segment of the eye, the iris, filtration angle, ciliary body, and anterior part of the choroid, and can be done to a certain extent with an ordinary convex lens. Sachs's lamp, however, gives far better results. It consists of a strong electric light (covered) with a cone-shaped projector, which is silvered inside and which bears in the extreme end of the cone a strong convex lens. A reflector is placed behind the light.

In using the lamp, absolute darkness is necessary if the best results are to be obtained. The point of the cone may be placed against the sclera, previously cocainized, or against the upper or lower lid. Some little manipulation is necessary to get the proper illumination, and the light must enter the eye at the proper angle. The nasal side of the globe is more easily illuminated than the temporal, as the bridge of the nose interferes with the cone of the lamp. If the lids are held back, the superior and inferior parts of the globe may be illuminated, though with about the same amount of difficulty as the temporal side. Prominent eyes are much more easily illuminated than receding ones, and lightly pigmented show better than heavily pigmented ones. Myopic eyes, as would be expected, illuminate well.

The details shown by transillumination may be briefly summarized as follows:

Cornea: Very little additional information is to be gained here further than can be obtained by focal illumination, except that in some instances it may be possible to localize an opacity in the cornea rather than in the anterior chamber, as where the anterior chamber is filled with exudate.

Filtration Angle: Here we have a region of the utmost importance in many pathological conditions, and about which we may obtain much useful information. Transillumination shows distinctly the width of the scleral projection at the limbus and the anterior limit of the ciliary body. In cases of wound extending into the sclera we may thus observe the exact relation of the wound to the ciliary body,—information which is often of vital importance. The scleral projection varies very greatly in different individuals, being much deeper in some than in others. Adhesions of the iris to the filtration angle, small amounts of hypopyon or hyphæma, inclusions of the iris after iridectomy, and, of course, any neoplasm at the filtration angle show clearly, and may be located much more definitely than by any other method.

Iris: Atrophic or congenitally thin spots in the iris show very well. Very frequently in old iritis the pupillary margin looks like a piece of lacework. In one case, in which an atrophic iris was bound up in a membrane after cataract extraction, the iris could only be differentiated from the membrane by transillumination. By oblique light it was impossible to tell where the iris stopped and the membrane began.

Lens: Details in the lens and anterior part of the vitreous show plainly, and it is easier to localize an opacity in a very hazy eye than by any other method of illumination.

Ciliary Body and Choroid: The anterior and posterior limits of the ciliary muscle show distinctly as well as the ora serrata. Exudates or tumors, either of the ciliary body or anterior part of the choroid, may be plainly seen. Retinal detachments show only as a faint shadow or frequently not at all. Atrophy of the ciliary body may be plainly seen, and beginning ectasiæ in the ciliary region show well. Foreign particles of metal show very distinctly and may be seen even when the lens is opaque, under which circumstance they could not be seen in any other way, unless perhaps by the fluoroscope. They must, however, be near the sclera to cast a shadow, but when one considers how frequently foreign bodies lie close to the ciliary region the wide application of this method is apparent. He has no doubt that it would be impossible by this means to determine the exact position of a lens luxated into the anterior part of the vitreous, though he has had no opportunity to try it on such a case.

Finally, on account of the variations in pigmentation of the uvea and the anatomical configuration of the orbit, there is a

wide difference in the ease with which different cases may be transilluminated. Many cannot be transilluminated at all, and others only fairly well, but in a large number, perhaps the great majority, it can be satisfactorily done, and it undoubtedly furnishes us with much valuable information which is often unattainable in any other way.

Dr. COBURN stated that in 1892 he had seen a similar method employed in Vienna. A glass rod was used to transmit the light. The rod was long and did not become hot. He had used it to detect tumors and had found it very satisfactory.

The Sachs apparatus was undoubtedly an improvement.

MONDAY, APRIL 17, 1905. PRESIDENT DR. W. B. MARPLE IN THE CHAIR.

Dr. H. KNAPP presented a case of **traumatic suffusion of the cornea with blood.** The eye had been injured by a snowball and enucleation had been recommended. Dr. Knapp saw the patient about four weeks later: there was circumcorneal injection and the cornea was suffused with blood. He remembers having seen five other cases. They recovered slowly and one regained good sight. The blood was being absorbed from the periphery of the cornea. At first it was of a brownish color; now, brownish gray. The eye has perception of light but the projection is bad, showing that the eyeball itself is still full of blood. Sometimes these cases take two or three years to clear up. There is no danger of sympathetic involvement of the other eye, so far as the speaker knows. In Dr. Knapp's case the tension at first had been minus, later it became normal. Pathology has been given by Vossius, Treacher Collins, Weeks, and others. The coloring matter of the blood dissolves in the anterior chamber, infiltrates the cornea, and is converted into hematoidin which very slowly disappears.

Dr. T. R. POOLEY presented a case of **blepharoplasty for epithelioma.**

The growth was situated near the external canthus and was found upon removal not to extend through the skin, but it invaded the conjunctival margin of the lower lid for about half an inch. After removal a raw surface was left, extending for half an inch along the outer part of the lower lid and for half an inch downward on the cheek. Dr. Pooley filled this space

by making two divergent incisions, each about two inches long. The upper one extended horizontally downward from the external canthus, the lower one commencing in the lower-outer angle of the wound; the skin below this incision was reflected. The flap was then thrown over the surface and kept in place by sutures; the upper-inner angle of the flap being fixed to the outer end of the lower lid, and the lower-inner angle of the flap to the inner-lower angle of the wound. There was very little hemorrhage and the raw surface was perfectly covered. Two weeks later the wound had entirely healed and the patient was discharged.

Dr. E. L. Oatman presented a case of **lymphatic leukæmia with retinal hemorrhages.** The patient was a Syrian thirty-two years of age; was never sick until within the past year. He came to the clinic of the Manhattan Eye and Ear Hospital complaining only of a slight conjunctivitis. He had noticed no loss of vision. The left eye had always been amblyopic. Vision: R, $\frac{20}{20}$; L, fingers at three feet. He was intensely anæmic. Blood examination showed that he was suffering from the lymphatic form of leukæmia. With the ophthalmoscope numerous hemorrhages were seen in both eyes along the courses of the retinal vessels. They occurred centrally, which appears to be contrary to the rule, the usual location of leukæmic hemorrhages being at the periphery. The extravasations were mostly into the inner layers of the retina. A few were subhyaloid. Those situated in the retina exhibited the white centres characteristic of the disease.

Three days after coming under observation he suffered a sudden loss of vision in the right eye during a fit of sneezing. Dr. Oatman saw him five hours after this occurred and found a large hemorrhage covering the macula. This fresh hemorrhage contained a round, sharply defined, brilliantly white centre, which supports the theory that the white areas observed in leukæmic hemorrhages are masses of leucocytes which have migrated through the walls of the vessels.

The veins were rather tortuous. The arteries showed very broad light reflexes.

Dr. Percy H. Fridenberg presented a case of **obscure orbital affection with exophthalmos.**

The patient, a married woman of forty-five years, always well and with good vision. Menopause, August, 1904. No history of

syphilis. In February, 1904, noticed a yellowish speck "like a piece of jelly" on the white of left eye. This eye had been struck with a piece of wire five years before, had been red for a day or two, felt sandy, and was irritable for the last two years. After several months (July, 1904), the eye began to be prominent, and lids looked swollen and watery, and then vision became slightly affected. Had diplopia (?); when going downstairs, says things looked hazy.

No nasal abnormality. Urine examined and found normal, except for excess of uric acid. Examination showed slight exophthalmos; no deviation. Passive œdema of lids and some chemosis of temporal half of conjunctiva of RE. No diplopia. Pupils normal. Motility very slightly limited on extreme excursions only, in all directions. V,RE, $\frac{20}{40}$ + with correction. Ophth.: Disk congested and slightly hazy. Under treatment with inunctions and iodides, with hot applications to the eye, vision improved to $\frac{20}{20}$ and disk cleared (Dec. 21). Chemosis of conjunctiva gradually increasing. Exophthalmos unchanged. Transillumination of antrums and frontal sinus negative. By January, 1905, patient had been taking KI 3 i t. i. d.; For some months vision was good and eye seemed slightly less prominent. April 1, 1904, vision $\frac{20}{30}$. Lower lid margin purplish. Chemosis marked. Œdema of lids. Exophthalmos quite noticeable; not extreme, but globe cannot be pushed back, and tense resistance is felt. No bruit heard over eye. No change in degree of exophthalmos noted when patient stoops. Slight diplopia elicited in extreme periphery of fixation field. In this case, gumma, accessory disease, orbital osteoma, can be excluded, the last on account of negative finding with X-ray photography.

Dr. E. GRUENING presented a patient from whom the **right lachrymal sac had been extirpated** four weeks previously. The incisions of the skin measured $2\frac{1}{2}$*cm.*, 1*cm.* of which was above the canthal ligament and $1\frac{1}{2}$*cm.* below it. The canthal ligament was severed. Mueller's speculum was introduced to check the lateral bleeding and Axenfeld's speculum to compress the upper and lower angles of the wound.

The periosteum of the nasal process of the superior maxillary bone was cut down to the bone and then lifted with a small blunt elevator. With this instrument the sac was detached from the underlying bone in the fossa lachrymalis. In this case the sac was thin-walled and very much dilated. It was seized, drawn

forward, and freed from its attachments. The wound was closed with sutures. Healing was somewhat delayed by infiltration and hardness along the line of incision, yet to-day there is hardly a trace of a scar visible. In closing the wound, the cut ends of the canthal ligament were not united by sutures, and there is neither bulging nor any other deformity of the inner angle of the eye. The specula of Mueller and Axenfeld did good service in the case, causing the field of operation to remain free from blood, and by their use the duration of the operation was materially shortened. In this particular case it had taken but five minutes.

Dr. GRUENING had records of 35 operations of extirpation of the lachrymal sac performed during the last four years. In 15 cases he had employed Mueller's and Axenfeld's specula. The subperiosteal method, as described by Axenfeld, simplified the operation and was commendable.

Dr. J. A. GEHRUNG presented two cases for Dr. D. W. HUNTER. The first was a woman, who, when first seen was suffering from a **bilateral dacryo-cystitis with a muco-purulent discharge** of eight years' duration. A slight improvement resulted from probing and irrigation. The left sac was then extirpated according to Dr. Gruening's method, with the result that very slight epiphora was left. Otherwise the result was perfect. About two months later the right sac was removed, the operation being performed in the same manner as before. The canthal ligament in this case, however, was cut and sutured. The result was perfect and at this time the epiphora of the left eye had almost ceased.

The second was the case of a girl seventeen years of age who presented a **contracted orbital socket.** The eye had been destroyed by injury when the patient was five months of age and had been removed one week later. She had worn an artificial eye since her seventh year, without much discomfort excepting that the eye would often slip out and a yellowish secretion would escape on removal of the eye at night. Some time previous to her presenting herself at the clinic, she had suffered from abscess of the upper lid which had been freely incised and drained. When seen there was no cul-de-sac above, and the lower cul-de-sac was very shallow. The external canthus was divided and the conjunctiva separated about *3mm* from the margin of the upper lid and dissected downward. The tissues were then divided up to the superior orbital ridge to form an upper cul-de-

sac. Wolff graft was inserted and held in position by sutures above, and through the upper artificial fornix and through the periosteum of the upper orbital margin, brought out at the brow, and tied over little pledgets of iodoform gauze. The sutures were needled at both ends. The upper free margin of the flap was sutured to the upper lid and the posterior margin to the cul-de-sac of the lower conjunctiva. An oval disk of dental rubber was inserted to maintain the graft in position and to separate the surfaces. The lids were then closed with three sutures to prevent the disk from slipping out. In about three weeks the patient was discharged, and her present condition, about three months later, shows a very successful result, patient wearing an artificial eye with every comfort and presenting a very deep cul-de-sac.

Dr. W. E. Lambert presented a piece of **iron** which had been **extracted from the globe** after having been localized by means of the X-ray.

Dr. Wilbur B. Marple presented a **specimen of double perforation of the globe (left eye) by a bird-shot.**

This patient was accidentally shot in the left eye while out hunting with a companion. The shot entered exactly at the nasal limbus, almost on the horizontal meridian of the cornea. There was no prolapse of the iris, but there was a coloboma to the nasal side ; the iris had probably been forced back. There was a partial cataract. Several of the shot embedded themselves at various points in his face and shoulder. The patient showed symptoms of sympathetic irritation in his other eye (the right), six weeks after the injury, which necessitated enucleation. The optic nerve was cut very long, and after removal of the globe the shot was found a few millimetres back of the globe, and two or three millimetres to the temporal side of the optic nerve.

Dr. D. H. Wiesner presented a case of **retinitis pigmentosa** and a case of **total paralysis of the left external rectus** in two members of the same family.

In the case of retinitis pigmentosa, night blindness had gradually developed since childhood. The patient at present was forty-five years of age. He had been able to attend school and to read, up to his nineteenth year. From the nineteenth to the twenty-seventh year, his vision became so reduced that he was able to decipher only very large print, and for the last eleven years had been totally blind. The pigment spots were well-

marked over the retina, and the nerve and retina were characteristically atrophic.

The case of paralysis of the external rectus existed in the nine-year-old daughter of the patient with retinitis pigmentosa. There was hypermetropic astigmatism of + 1.25 in both eyes. Diplopia only occurred when the head was fixed. There was never any diplopia under other conditions. She suffered from some symptoms of asthenopia.

Dr. JOHN E. WEEKS presented a patient with **extreme pallor of the optic disks.**

The patient, a male, aged twenty-three years, at the age of three suffered from meningitis, and, according to the mother, was blind for a number of weeks. The sight gradually returned At the present time, the fields of vision for form and color are very slightly, concentrically narrowed.

The optic disks are very white, the trabeculæ of the lamina cribrosa not visible. Retinal pigment at margins of the disks disturbed. Blood-vessels small, particularly the arteries, and reduced in number.

The vision of the right eye is $\frac{20}{30}$ minus.

The patient was presented because of the rather unusual occurrence of the retention of good vision after severe optic neuritis.

In the discussion, Dr. J. E. WEEKS in referring to Dr. Knapp's case of traumatic suffusion of the cornea with blood, stated that the tissues of the cornea became acid near the centre but not at the periphery. For this reason, hæmatoidin was precipitated around the centre of the cornea but the periphery remained clear.

In reference to Dr. Weeks's case of extreme pallor of the optic disks, Dr. POOLEY had recently seen another equally pronounced. The patient, years previously, had suffered from nicotine poisoning nearly resulting in blindness. The vision in each eye was $\frac{20}{15}$. There was no defect in the field either for form or color.

Dr. P. FRIDENBERG thought that the picture presented by Dr. Oatman's case of leukæmia was unusual. The hemorrhage in the macular region was subhyaloid. All the hemorrhages were superficial, and might be due to some other condition.

Dr. OATMAN replied that there were no other lesions. In brunettes, the salmon color of the fundus was not to be expected. As to the location of the hemorrhages, these might occur anywhere in leukæmia.

Dr. WEEKS thought that the white patch in the centre of the hemorrhage was typical of leukæmic retinitis.

Dr. POOLEY thought that Dr. Fridenberg's case was probably one of tumor of the sheath of the optic nerve.

Dr. A. DUANE thought the tumor was outside of the optic-nerve sheath.

Dr. G. S. DIXON presented a new instrument, consisting of **a modification of Dr. Sweet's method of centring the cornea adapted to MacKenzie-Davidson's localizing apparatus.**

(Described in full in these ARCHIVES, vol. xxxiv., No. 3.)

Dr. H. KNAPP had recently seen a case in which the McKenzie-Davidson method had not revealed the presence of a foreign body and neither did the Haab magnet, but, from the history, and the lack of any indication of the presence of a foreign body in the eye, it appeared clear that a foreign body had ripped, but not penetrated, the eye. Inflammatory symptoms subsided soon, and the hemorrhages, resulting from the injury, being absorbed, the patient was sent home with a useful eye.

Dr. J. E. WEEKS was at present employing the Mackenzie-Davidson apparatus in the recumbent position.

Dr. E. GRUENING read a paper entitled **the indications for, and the technique and results of, extirpation of the lachrymal sac.**

The indications were as follows: (1) Obliteration of the naso-lachrymal duct. (2) Hydrops of the lachrymal sac. (3) Stubborn blennorrhœa of the sac, with bulging of the lachrymal region. (4) Fistula of the lachrymal sac, especially in cases in which by recurrent phlegmonous inflammation the integument has become indurated and intimately connected with the sac wall. (5) All catarrhal conditions of the lachrymal sac not amenable to treatment by ordinary means. (6) Mature cataract complicated with blennorrhœa of the sac. (7) Ulcus corneæ due to blennerrhœa of the sac.

The method of operating which Dr. Gruening favors is that which has been previously described in the case which he presented this evening.

The incision is short. Mueller's and Axenfeld's specula are employed to furnish easy access to the deeper structures, and also to limit the hemorrhage. A special knife, broad, with short blade, resembling somewhat a periosteal elevator, is introduced

to the nasal side of the sac and carried deeply to the bottom of the lachrymal canal, thus isolating the sac and saving much time that is usually lost at a tedious dissection.

Dr. Gruening rather prefers to cut the canthal ligament, and when he does so does not take the trouble to suture it afterwards.

Dr. Pooley thought the thorough cleansing of the parts before operation was exceedingly necessary, on account of the infectious character of the pus, and he advised that, after disinfection, a plug of gauze should be carried up, well under the inferior turbinated bone, thus cutting off communication with the nose and preventing blood from coming into the pharynx. Conservative treatment could be carried too far in these cases, and he did not wait as long before operating as had been his custom in former years. The description of the operation given by Dr. Gruening had taught him much. The sac, of course, should not be opened. Injection with starch or paraffin he had found of no service, for one evacuated much of this substance by pressure during the operation. Extirpation of the sac was indicated perhaps most forcibly when dacryo-cystitis existed and one wished to operate upon the globe. In these cases, all other means were, in his opinion, inefficient. He did not think that the canthal ligament should be cut.

In the after-treatment, union by first intention was greatly to be desired. The obliteration of the canaliculi was not necessary.

Dr. Arnold Knapp did not think it was necessary to remove the periosteum as routine, but it was often impossible to do otherwise. He did not think the Mueller and Axenfeld specula necessary. Good light and the absence of severe hemorrhage were essential.

Dr. A. Duane believed in operating during acute stage if necessary. Of course, in those cases, adhesions caused trouble. When the sac had previously been opened, stuffing with iodoform gauze rendered great service during its removal.

Dr. H. Knapp thought it best to remove the periosteum, and did not consider it necessary to suture the ligament.

Dr. J. J. Thompson thought that the wound should be as short as possible. The shorter the wound, the less hemorrhage would be encountered. He dissected down on both sides of the sac, and then passed a specially constructed hook underneath it. The end of this hook contained an eye which was threaded after its

passage. The hook then being withdrawn, the sac could be tied off at its lower end, and, by using this suture to elevate the sac, the latter could very easily de dissected out from below upwards. He did not think it necessary to sever the canthal ligament. He had operated in this manner in some fifteen cases, and had found it very satisfactory.

Dr. GRUENING, in closing, did not believe in a small incision, and when the incision was made entirely below the canthal ligament one might get into the orbital fat. He did not think it necessary to plug the nose, and he repeated, that he considered the Mueller and Axenfeld retractors very important; with their use bleeding was slight. He thought, as a rule, the periosteum was removed with the sac.

REPORT OF THE MEETINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

THURSDAY, JUNE 8, 1905. JOHN TWEEDY, F.R.C.S., PRESIDENT, IN THE CHAIR.

Messrs. R. W. Doyne and Sydney Stephenson read a paper on **cribriform choroido-retinitis,** a rare form of fundus disease. They described three cases in adult patients of a peculiar clinical type of choroido-retinitis, characterized by large sheets of white exudation, lying in the fundus beneath the retinal vessels, and showing few or many round or oval holes, through which the color and markings of the underlying choroid could be recognized. In some instances the holes might be filled with pigment. There were grounds for thinking that the affection had resulted from acquired syphilis. The authors rejected the view that the condition of the fundus was the outcome of the metamorphosis of copious hemorrhages.

Mr. Leslie Paton read a paper on **the course of optic neuritis and its subsidence after operation in cases of cerebral tumors,** and in it he analyzed a series of 105 cases which had occurred at the National Hospital during 1903 and 1904. Of these cases there were 30 in which it was possible to examine more or less fully the eye condition after operation, and these cases fell into four groups as regards vision. (1) There were 8 cases in which the vision was little if at all impaired. (2) In 11 cases the patients were blind or almost blind before the operation and afterwards their vision recovered, in some even up to normal acuteness of sight. In group 3 were those cases which were practically blind at the time of the operation and

which regained no vision (6 cases), and also those in which the vision failed markedly in spite of the operation (2 cases), giving a total of 8 cases out of 30 operated upon which did not save the sight. In group 4 were 3 cases in which one eye retained good vision while the other became blind or nearly so. A notable symptom in these cases was attacks of transient dimness of vision, which occurred most frequently in the cerebellar cases, and were most probably dependent upon interference with the vascular supply of the occipital lobe.

In different cases the optic neuritis showed different appearances, and the cerebellar cases showed more swelling of the disk than did those in which the tumor was situated in the frontal or parietal lobes, while macular changes appeared only in a small number of cases, and even when these were present they were not necessarily associated with any interference of vision; this is in favor of the changes being superficial. The intradural tension was in all cases high. The swelling of the disk subsided gradually, but more rapidly in cystic cases, while in those which led to blindness, the disk assumed a papery-white appearance, with arteries much diminished in size. In some cases where the sight was retained the disk had usually a muddy grayish-pink appearance, but this tended to disappear, and in some of the cases it was impossible to tell from the appearance of the disk that there ever had been optic neuritis at all; this was so in one case where there had been extensive macular changes, but the vision recovered to $\frac{6}{6}$.

Mr. L. Werner (Dublin) described the case of a boy aged eighteen, the sight of whose right eye had been failing for nine months before being seen, and black spots were lately observed upon the iris. When seen, the iris was covered with coal-black spots of pigment, less marked above, and in addition there was a small brown tumor wedged into the angle of the anterior chamber at the outer side. The A. C. was deep although the tension was high, and there was a deep glaucoma cup; the vision was "hand-movement" only. The eye was enucleated and the patient remained in good health one and a half years after the operation. The tumor was a spindle-cell melanotic sarcoma which affected the ciliary body, and the neighboring parts were infiltrated with pigment cells which extended into the canal of Schlemm. Black cells extended into the angle of the anterior chamber, and a large number of detached cells were lying loose at the bottom. The

case was a **typical example of a ring scotoma** of which about seven cases have previously been recorded.

Mr. CANT (Jerusalem) read a paper on **the use of strong applications in the treatment of ophthalmia.** He said that in Palestine, among the numerous practitioners, both qualified and unqualified, there were many methods employed in the treatment of ophthalmia, and among them were very strong solutions of nitrate of silver,—one practitioner informed him that he applied it to the eyes in a solution of 20 %, while he himself had seen a prescription in which a solution of sixty grains to the ounce was ordered.

These exceedingly strong solutions are productive of a great deal of injury to the eyes, lids, and conjunctiva, which they so damage that necrosis takes place, and this favors, rather than retards, the development of organisms that may survive or else become subsequently inoculated into the eye. Such treatment precludes the further use of this most useful drug, and he urged that it was never advisable to use a stronger solution than twenty grains to the ounce, and seldom should one go beyond fifteen grains or 3 %, while a 2 % solution is the most useful strength for the majority of cases.

Mr. RICHARDSON CROSS described the microscopical appearance of a tumor he had removed by Krönlein's operation, from a patient who was shown at a previous meeting of the Society, who suffered from a tumor of the orbit. He gave details of the operation, and the growth was proved to be a **fibro-adenoma** containing cysts.

Dr. G. A. BERRY read a paper on **visual efficiency.** He considered that indemnification to sight after injury was in many respects unsatisfactory to both parties, there being no recognized scale according to which compensation can be calculated. He pointed out that it was impossible, having regard to the different value of good eyesight to different individuals, to formulate an **invariable scale of efficiency.** He proposed that a scale of efficiency that possessed some elasticity or adaptability to different conditions, which correlated efficiency with visual acuteness, as tested by the recognized methods, might be established on the basis of certain statistics which could probably easily be got. Such a scale was proposed as a guide. The first thing to determine was the degree of vision in one eye alone which just corresponded, for any particular employment, to a complete loss

of efficiency. The second was the average loss, for different occupations, in efficiency, caused by complete loss of vision in one eye alone, the other having full vision. The total efficiency, taking the vision of both eyes into account, was then discussed as a particular function of the separate efficiencies of each eye.

FRIDAY, JULY 7, 1905. JOHN TWEEDY, F.R.C.S., PRESIDENT, IN THE CHAIR.

Mr. R. Q. CRUISE described a case of **microphthalmic cyst of the orbit.** The patient, aged twenty-four, from birth had had a swelling in her left orbit which had been increasing in size for the last two years. There was a small degenerated-looking microphthalmic eye pushed into the upper and outer quadrant of the left orbit. The rest was filled with a fleshy mass which was firm and fluctuating. There was a coloboma of the iris, lens, and choroid in the right eye. The left orbital contents which was cystic was removed. On examination the sclerotic was deficient it its posterior half and through this the retina protruded into the cyst. The iris was adherent to the cornea in its whole extent. The lens is displaced backwards and held in position by a strong band of fibrous tissue attached partly to the globe and partly to the cyst. The cyst enveloped the globe above, below, and to the nasal side. The microscopical characters and peculiarities of the eye were carefully described and showed various developmental peculiarities, while the choroid had some fine bone developed in it. Clinically the diagnosis was by no means easy, especially the differential diagnosis between it and meningocele.

Pathologically the chief peculiarity was the free communication between the eyeball and the cyst which allowed the free passage of fluid secreted by the well-developed ciliary body to pass into the cyst, and this led to the increase in size of the cyst for which reason the patient applied for treatment.

Mr. SIMEON SNELL (Sheffield) gave details of a case of **sympathetic ophthalmitis** in which normal vision was restored in the exciting and sympathizing eye. The patient was a man aged thirty-three whose left eye was wounded on September 8, 1904, and when seen for the first time, eleven days later, there was a wound of the cornea extending into the ciliary region with a prolapse of the iris. The prolapse was at once excised and the eye healed without further trouble.

On October 12th the right eye was noticed to be red, and five

days later there was iritis, and it was then noted as being a severe case of sympathetic ophthalmia. About a month later the pupil began to act and the eye to whiten. Since then recovery had been perfect and vision is now $\frac{6}{6}$ and J 1 in each eye. Mr. Snell referred to another similar though less severe case which he had recorded in the *Transactions* for 1883.

Mr. Snell recorded also three cases in which **sympathetic ophthalmitis** had come on after excision of the eyeball. The first was a boy aged ten who had a large wound of the cornea and sclera. Sixteen days later the eye was removed. Three weeks later there was sympathetic ophthalmitis. The disease ran a severe course and the patient can now, fifteen months after the accident, find his way about and read large print.

Another case was a man aged twenty-six whose eye was wounded by a kick which involved the corneo-scleral junction. Sixteen days later the eye was excised. A month later Mr. Snell saw him for the first time when there was marked sympathetic ophthalmitis in the other eye which had commenced a week before. It was a severe case and practical blindness resulted. He also referred to another case, that of a girl aged about ten; the dates, however, could not be given. He referred to a case he published in the *Transactions* for 1882, in which the disease showed itself thirty-two days after excision and one hundred and six days after the injury. Thus of these four cases one was mild and recovered, three were severe, and two of them became totally blind.

The report of the Society's committee stated that such instances were of a mild form and that out of 30 cases 18 completely recovered, 3 partially, and 9 were lost.

Mr. Snell also reported a case of a further instance of **glioma** in more than one member of the same family. He referred to the paper he read before the Society last year, in which he related an instance in which two members of the same family were affected. At that time only three observers had placed cases on record. He now related a further case. The patient was a male child aged two and a quarter years, and glioma was present in each eye. One eye had been noticed affected a few months after birth and the other a few months ago. It was then ascertained that the only other child of the parents was a girl born in 1897, who was similarly affected with glioma in both eyes and which proved fatal. Mr. Snell mentioned the fact that the child whose case he had recorded last year was still alive and well.

Mr. MAYOU read a paper on **secondary tuberculosis of the iris with spontaneous rupture of the lens capsule.** The patient was a boy aged three who for some time previously had suffered from tuberculous dactylitis. The eye was inflamed for three weeks before being seen. Masses of tubercle were then seen on the iris, which was very much inflamed. Hemorrhage took place later on into the anterior chamber and the eye was removed. On examination it was found that the iris was adherent to the posterior surface of the cornea and Descemet's membrane was perforated while the substantia propria was infiltrated. The mass on the upper part of the iris was adherent to the cornea and to the anterior and posterior parts of the lens capsule and contained giant cells, but no epithelioid cells or tubercle bacilli were seen. The anterior capsule showed a large gap evidently produced by the softening of the tubercle followed by cicatricial contraction. The retina also showed masses of round-cell infiltration similar to that seen on the iris. The chief points of interest were the unusual situation at which the tuberculous mass had invaded the cornea, the spontaneous rupture of the lens capsule, the nature of the exudation in the retina, and the general tendency towards cicatrization.

REPORT OF THE MEETING OF THE SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION, HELD AT PORTLAND, OREGON, JULY 11, 1905.

By Dr. J. H. REIK, Baltimore.

DR. CHRISTIAN R. HOLMES (CINCINNATI, OHIO), CHAIRMAN, PRESIDED.

Prof. J. Hirschberg, of Berlin, was introduced as an invited guest of the Society.

Chairman's Address by Dr. Christian R. Holmes: **Studies of school and hospital hygiene of interest to the ophthalmic surgeon** (illustrated with lantern slides).

The essayist reminded the members of the amazing expansion of all human activities in this country in the past few years, and especially of the efforts given to the building of new schools, colleges, and hospitals. As a people, he thought, we were slowly awakening to the importance of properly lighting, heating, and ventilating these new buildings in accordance with scientific laws; we no longer took old buildings and tried to remodel them to make them resemble what a school, college, or hospital should be, but made efforts to construct them upon the latest and most improved principles. He considered the problem of the lighting of schoolhouses as a comparatively easy matter, and said the law laid down by Dr. Risley could not be broken without disaster to the children's eyes—"that it is the duty of the architect to secure in his plans all the window surface possible consistent with safety of construction." Pupils should face a blank wall, of neutral tint, and the abundant light should be admitted from the left, or left and rear, so that the writing hand should cast no shadows upon the writing surface. A number of

pictures were projected upon the screen, showing badly lighted schoolhouses and those which were proposed as good models. The writer referred to the physical deterioration of children soon after entering school life, and to the large number brought to the attention of the oculist on account of progressive myopia. Out of 30,000 children examined in the schools of Cleveland, in 1899–1900, he said, 20 % were found to have defective sight, and in Indianapolis, out of 25,696, 32 % were trying to do school work with defective vision. The speaker advocated Dr. Risley's proposal that the schools should introduce a modified curriculum adapted to the physical capabilities of these scholars; the hours of eye and brain work should be cut down, or so distributed as not to become a drain that would be felt as a burden. In hospitals, sunlight and brilliant diffused daylight should have free admission. A more difficult problem in hospitals was the matter of ventilation. The different systems for securing proper ventilation were described and discussed in detail, with pictures showing the methods adopted in various hospitals and public buildings. Sanitarians and educators everywhere, Dr. Holmes said, were clamoring for proper and systematic medical inspection of school children, and it behooved those whose province is the eye to heartily second their efforts. He commented upon the work of Cohn of Breslau, Williams and Ayers of Cincinnati, Agnew of New York, Derby of Boston, and of Risley and his associates in Philadelphia, in working up the subject of the production of myopia by the ill-lighting of schoolrooms, and thought we had already gathered sufficient facts to justify a vigorous demand for the expert examination of the eyes of all school children as soon as they reach an age when they can be intelligently examined.

Dr. Leartus Connor (Detroit): **Is keratitis ever caused by rheumatism?**

The writer looked upon rheumatism as a "symptom complex" rather than a definite disease, and desired to separate it from the joint diseases due to "infected wounds," "typhoid fever," "acute follicular tonsillitis," or "septic pyæmia," in his discussion. Clinical experience, he said, showed that eliminative agents influenced most favorably both rheumatism and associated keratitis. In rheumatism, the fibrous tissues were chiefly attacked. Experiments had shown that ligations of the long ciliary arteries or the venæ vorticosæ produced a parenchymatous keratitis, though observations on the human subject were lacking to indi-

cate their force. He thought there was no *a priori* reason why the cornea should always escape the fate of tendons, endocardium, or joints, so that the question was pertinent, Does it escape? He considered that rheumatism might appear primarily in the sclera and secondarily in the cornea, or *vice versa*. Most ophthalmologists declared they had never recognized such keratitis, and most of the books did not mention the subject. A number of cases were reported illustrative of the author's views. In three, there was a clear history of recurring attacks of keratitis with rheumatism, the keratitis appearing with the rheumatic attack and fading as it declined; all benefited by anti-rheumatic treatment. All were classed as rheumatic keratitis, because they started in the cornea during an attack of acute rheumatism; some recurred many times; other constitutional causes were eliminated; they were non-suppurative; there were pain and photophobia disproportionate to corneal lesion; anti-rheumatic treatment alone promoted rapid recovery. Queries on the subject had been sent out to colleagues and more or less full answers received. Sixty-seven had never seen cases of corneal disease which they could ascribe to rheumatism. Several had seen keratitis which they ascribed to gout. Sixty had seen one or more cases. The full text of positive answers accompanies the paper.

Discussion.—Dr. W. H. Snyder (Toledo, O.) added two cases in which anti-rheumatic treatment and attention to diet produced a quick and permanent recovery.

Dr. W. H. Snyder (Toledo, O.) : **The physiologic action of dionin.**

The writer, after explaining the pharmacology and the physiologic action of dionin, described a number of experiments bearing upon its action on tissue and cells. The albino rabbit, medium size, was used; dionin in powder placed in each eye in larger quantities than would be necessary if the eye were abnormal; rabbits killed; globe and tissue enucleated, placed in formalin, 4 %, for forty-eight hours, and later sections made from cornea. Control specimens were also made from normal rabbit's eyes. Pictures of the findings were projected upon the screen, showing the usual signs of general œdema, vacuolation of the cells in the epithelial layer, the sections appearing water-logged and hazy. The lymph spaces were changed in shape and dilated. No absorption of cells, as in œdema of long standing. The surface

uneven and the general picture that of œdema of the cornea. He concludes that the action of the drug is purely local—greatest where the drug has actually rested; that its most marked action is in eyeballs where the tension is increased; that it has some disassociating action on the intercellular cement substance, allowing a transudation of serum from a globe under pressure; that its analgesic action is explained by its lessening of tension and the well-known action of the derivatives of opium. In iritis with adhesions plus tension, the use of dionin lessened tension and permitted absorption of the mydriatic, with prompt relief of pain and dilatation of the pupil. In corneal ulcers the repair process begins as soon as the ulcer is cleared. The more recent the inflammation and higher the tension, the better the results. In beginning pannus, the author had cleared up the cornea and resisted permanent opacity more satisfactorily than with any previous treatment, the lid, of course, being treated for the cause. In glaucoma he preferred it to eserine, relief from pain being very marked, due, he thought, to relief from pressure. In old vitreous opacities he had had poor success.

Discussion.—Dr. H. H. Brown (Chicago) called attention to the fact that a recent German investigator had found that dionin did not affect all animals. Experiments had been made with dogs, rabbits, and cats. The cats were not affected at all.

Dr. Snyder, in closing, said that the effect was very slight in rabbits, requiring a great deal more of the drug than the human eye.

Dr. W. H. Roberts (Pasadena, Cal.): **The correction of exophoria by the development of the interni.**

The writer considered that oculists were guilty of an error of omission when they treated asthenopic symptoms as though all were accommodative and none muscular, and recommended the necessity of determining the muscle balance in all refraction cases, emphasizing a known and tried method of relieving the majority of cases in which exophoria exists. While not opposed to operative measures when indicated, the author believed they should only be performed when the lack of balance could not be cured or relieved by other measures. A routine examination of muscle balance should be made in every case of refraction. The method used for developing the adductors consisted of exercises at home, reinforced by regular visits to the office for supervision and additional exercises. He placed the proper ametropic cor-

rection before the eyes, and directed the attention of the patient to a point of light six metres distant. Weak prisms, bases out, were then put on and the strength rapidly increased until the patient had difficulty in keeping the point of light single. He was then told to close the eyes, slightly stronger prisms inserted, and on opening the eyes he looked at an ivory ruler, twelve to fourteen inches from the eyes, the examiner's body shutting off the point of light. With the patient looking intently at the ruler, the examiner walked off back towards the light, and on reaching it stepped aside, the patient's gaze being quickly transferred to the point of light, which was usually single. If double, a weaker prism was used, until the image could be fused and then the strength increased. Prism exercises were also carried out by the patient at home. A number of cases were reported in detail to illustrate the author's views.

Discussion.—Dr. G. C. Savage (Nashville) considered that the proper treatment of the condition was to correct the tonicity of the interni ; that the muscles should be exercised ; that accommodation is strong, but convergence is weak and the prism exercises offer the proper remedy, exciting to activity the two basal centres and increasing the tonicity of the interni muscles.

Dr. F. B. Eaton (San Francisco) thought that the best way to cure the condition was to build up the general health of the patient ; that otherwise it did not make much difference how much exercise they were given. He considered the condition a neurotic one.

Dr. Dudley S. Reynolds (Louisvllle) agreed with the last speaker that systematic dieting and proper medication, the administration of full doses of nux vomica, etc., constituted the best treatment.

Dr. W. C. Posey (Philadelphia) thought the correction by prisms lasted only so long as the exercises were continued ; when the exercises were discontinued the trouble returned.

Dr. S. D. Risley (Philadelphia) referred to the cases dependent upon faulty or abnormal development of the orbit, in which faulty attachment of the muscles existed, and said that no amount of exercise would cure them. He doubted very much if any amount of exercise ever strengthened the ocular muscles in the sense that the biceps might be strengthened.

Dr. John E. Weeks (New York) believed that there is a class of cases that may be benefited by these exercises, but that there

is also a class of cases, as Dr. Risley had mentioned, that never could be benefited by these exercises ; each class of cases should receive its proper treatment, and the means of determining what that treatment should be could be found in the perimeter or the tropometer.

Dr. C. H. Williams (Boston) said that in the use of the Maddox rod he found that there was always a tendency to bring the line and the light together, a tendency to fuse images. This could be avoided by the use of the apparatus which he had shown to the section at St. Paul, consisting of a series of green figures with a red line running through them, while in the spectacle frame was placed before one eye a red glass, and before the other a green one, so that the line is seen with one eye and the figures with the other.

Dr. Wm. Zentmayer (Philadelphia) thought a great many cases might be relieved without prisms by putting on a very partial correction and relieving the disturbance caused by the correction of the hypermetropia.

Dr. Leartus Connor (Detroit) believed that the essential truths of the paper could not be controverted. He had not been able to explain, however, why so many cases of muscle imbalance got along without any trouble. He also advocated the use of very deep massage over the medulla and of the vibratory variety. Sometimes where he had not obtained results with the lower prisms he had used as high as 100 or 120 degrees.

Dr. J. S. Kirkendall (Ithaca) said that aside from general systemic conditions there might be causes that should always be looked for. He had had one case which was relieved by the removal of a plug of cerumen from the ear. Nasal conditions were also to be taken into consideration, spurs of the septum, enlarged turbinates, etc. These reflex causes should always be looked for.

Dr. Edw. Jackson (Denver) : **Lateral displacement of tendon insertions for the cure of strabismus.**

The writer said that the four recti muscles have practically a common origin, and if it were possible to shift the insertion of one to the site of the insertion of the other, a complete change in its action would be effected. Such a change was impracticable, because of other tissues in the orbit, but enough alteration was possible to modify their action. By moving their insertions inward, the superior and inferior recti could be made to assist con-

vergence; by moving them outward, to resist convergence. Such shifting of the insertion might be effected by complete tenotomy, with suture of the tendon in the desired position. A lesser change might be produced by partial division of the insertion, leaving the edge standing.

Discussion.—Dr. G. C. SAVAGE (Nashville) did not agree with the writer that if a muscle were detached and connected with another it would perform the function of the other muscle. It depended upon the nerve impulse. He thought a muscle should not be displaced by advancement unless there was cyclophoria. If there was cyclophoria a marginal tenotomy should be done.

Dr. JACKSON (Denver) said, in closing, that the operation had been done by himself and by Dr. Stevens of Denver with complete success. He believed the bad ultimate results from tenotomies that were still sometimes seen were not due to the fact that tenotomies were not proper, but to the fact that the operation was done in cases that should not be so treated.

Dr. MEYER WIENER (St. Louis): **Transitory paralysis of the abducens; with report of cases.**

The author referred to the evident functional character, with usual absence of hysterical symptoms, the comparative frequency and scant amount of literature on the subject. The condition was considered self-limited and all the cases occurred in young females and were monocular. Those of previously reported cases were double-sided, in older persons, and associated with other hysterical symptoms. The writer maintained that the cases proved that a functional (or hysterical) paralysis of the abducens does occur, may be unilateral or bilateral, and that there need not necessarily be any other hysterical sign or symptom evident.

Discussion.—Dr. H. STILLSON (Seattle) thought that the ability to rotate the eye outward depended largely upon the individual's facility and that the education of one's externi was more difficult than the education of one's interni. The difference in the ability of different individuals to rotate the eye outward was surprising. He thought, therefore, that some of these cases might be put in the class of cases due to hysteria or to individual lack of facility in rotating the eye.

WEDNESDAY, JULY 12TH. MORNING SESSION.

Dr. VARD H. HULEN (San Francisco): **Demonstration of a simple method of accurately localizing by the X-ray a foreign body in the eye.**

Dr. HULEN exhibited his method with apparatus and patient. The instrument for holding the tube and fixation of the patient were very simple, and such that the patient could not move. Fixation of the head was secured by means of the teeth fastening upon a piece of soft wood. The tube was so placed that the point where the wires cross and the V-shaped sight were in a direct line. The anodes could be raised or lowered and moved from side to side. A lead strip was used upon the lower lid and the measurement from the centre of the cornea to the top of the lead taken; then the distance posteriorly from the apex of the cornea to the piece of lead, and the distance from the anode to the cross wires. The method of plotting the location from these measurements was demonstrated by means of charts upon the board.

Discussion.—Dr. JOHN E. WEEKS (New York) said that the first work in determining the location of foreign bodies in the eye had been done by Sweet, of Philadelphia, who antedated McKenzie Davidson by about a year. He thought an improvement upon the apparatus might be made in having the patient in a recumbent position with the head strapped to the plate holder. Dr. Dixon, of New York, had devised a head-rest of this kind. He thought too that the patient should fix some object, and used for that purpose a little ball held just above the head, parallel to the plane of the plate-holder. There was a possibility of error in the relation of the marker to the eyeball when it is placed on the lid because the patient did not at all times keep the lids still. Dr. Dixon and the speaker had devised a chart for plotting the localization of foreign bodies, in which millimetre squares were used so that one could see at a glance the exact location and distance from any given point.

Dr. EDW. JACKSON (Denver) was very much pleased with the simplicity attained by Dr. Hulen in his method, and thought the fixation by means of the teeth very excellent.

Dr. JOHN A. DONOVAN (Butte, Mont.): **Blasting eye injuries.**

The writer described the various methods employed in mining and explained the causes of accidents. He concluded that with but few exceptions blasting injuries resulted from want of care on the part of the patient or his associates; that the eyes should be examined immediately, the larger foreign bodies removed, atropine used, and the subsidence of general reaction awaited; when reaction subsides, remove particles as symptoms indicate,

when not practical to remove at once; foreign bodies inside the eye had better be removed as soon as located; in children, anæsthesia to be used if the specks were deeply embedded; favorable prognosis should always be guarded; deep internal changes often being produced; never operate to restore vision until inflammatory signs have disappeared; nothing should be done or said that could not be substantiated in the courts, careless remarks encouraging patients into litigation, the ultimate consequences of which were disastrous to the client.

Dr. F. C. HEATH (Indianapolis): **Some eye injuries and their lessons.**

The author presented reports of three groups of three cases each. Group 1, foreign bodies in the lens; group 2, foreign bodies in the iris; group 3, wounds in or near the ciliary region. Observations were made on, and lessons drawn from, the comparison of the different features of these cases as to course, results, and management. The author was persuaded that the safest course is to resort to surgery, at least where the prolapse is in or near the ciliary region. He had never had cause to regret resorting to such procedures.

Dr. FRANK W. MILLER (Los Angeles): **Traumatic lesions of the eye.**

The writer called attention to the increasing frequency of these lesions, and referred to the classification, old and new. The import of the injury depended upon its location and extent and upon the inflicting agent. Infection and hemorrhage were the distressing possibilities and of grave consequence. In the non-penetrating wounds an expectant attitude might be assumed, but in these only. The use of the cyanide of mercury was especially advocated, subconjunctivally after Darier's suggestion. The introduction of iodoform into the interior of the eye was also referred to, but personally its use had been disappointing. Every effort should be made to remove the foreign body, an occasional tolerance offering no excuse for allowing it to remain. All prognosis should be guarded.

Discussion.—Dr. EDW. JACKSON (Denver) agreed with Dr. Donovan, and thought the lines laid down by him for treatment of these cases the best that could be followed: the large bodies to be removed at once, the smaller ones from time to time as they make trouble; and still others to be let alone always. He also referred to the beneficial influence of the X-rays upon these eyes.

Prof. J. Hirschberg (Berlin) believed that it was not safe to leave foreign bodies in the eye; they were deceptive. Every particle should be extracted from the posterior part of the globe. It should always be done at once. Foreign bodies from shoeing horses, he said, were especially infectious. We could in other cases have no test of the infectiousness of the foreign body, and so in fresh cases they should always be removed at once. The giant magnet should never be applied as a means of diagnosis. If the splinter is as large as the papilla optica, the formation of connective tissue follows, and there is detachment. He always attempted to dislocate the foreign body from its bed by means of the hand magnet. If the body has been gotten into the anterior chamber, an incision is made and the tip of the curved point used to draw it out, then the iris is replaced and the pupil remains clear.

Dr. E. Smith (Detroit) had used the Hirschberg magnet for many years, and had been successful in many instances with the hand magnet where the Haab giant magnet had failed. Where the foreign body has been located, incision in the sclera in the vicinity of the body was preferable to the use of the large magnet with its danger of drawing it into the ciliary region.

Dr. L. H. Taylor (Wilkesbarre) thought it was not so much the location of the injury as the nature of the foreign body—what might be on it. Some very serious injuries get well with very little difficulty, while other apparently slighter ones cause great damage. If we could only be sure of watching the patients, many eyes that are enucleated might be saved.

Dr. John E. Weeks (New York) thought the prognosis should depend very largely upon the character of the foreign body. Iron and steel dangerous in every case unless removed. Copper and zinc produce suppuration and inflammatory reaction of severe type. Particles of glass may, under certain conditions, remain indefinitely without causing trouble. Lead will in the majority of cases set up irritation, though shot may remain in the eye for many years. The giant magnet should not be used for diagnosis. He used the T-shaped incision in removing bodies from the anterior chamber.

Dr. S. D. Risley (Philadelphia) emphasized Dr. Donovan's remarks upon the importance of waiting before operative interference for the removal of cataractous lens. Where the foreign body is entangled in the iris, he thought it better to do an iridec-

tomy, because the iris is prone to take on inflammatory reaction of a plastic character. After the localization of the foreign body, he thought it safer to remove it without the use of the giant magnet, the scleral puncture and the employment of the Hirschberg magnet being preferable; the point should not be inserted into the vitreous. He thought the giant magnet dangerous if the foreign body was of considerable size. Dr. Risley also alluded to the non-magnetic character of the manganese steel, which might often cause disappointment.

Dr. Ward D. Stevenson (Akron) referred to the use of iodoform in cases of beginning panophthalmitis, and had devised a little instrument for placing the powder within the eye without any difficulty. He preferred the powder, because it remained for a considerable time. Fluid was apt to be washed away by the aqueous humor.

Dr. Mark D. Stephenson (Akron, O.): **Description of an advancement suture, with collective suggestions regarding operations on the ocular muscles.**

The writer considered that an advancement alone, or combined with a tenotomy, is to be preferred to a tenotomy alone. Usually when an advancement was performed it was advisable to wholly or partially tenotomize the opposing muscle of the same eye. He described his advancement suture, which was a modified Worth's, the method of suturing being the only essential difference. Circular-letters had been addressed to ophthalmic surgeons throughout the United States, in order to get their views regarding some of the difficult questions in ocular-muscle operations, and the replies are given.

Discussion.—Dr. W. C. Posey (Philadelphia), while he believed the operation described a good one for operating on a good stout tendon, in thin tendons would prefer the double stitch.

Dr. John E. Weeks (New York) desired to protest against any stitch that bunches a muscle, which he thought the single stitch did; the muscle was not spread out, and did not have the effect on the eyeball that it should; the attachment to the globe was by a few bands relatively. The operation should spread the muscle out and give a linear reattachment.

Dr. Mark D. Stephenson (closing) thought the bunching of the muscle, as referred to by Dr. Weeks, occurred particularly where the capsule and conjunctiva were not included, but where they were included he did not find that to be particularly true. He considered that it gave a good attachment.

WEDNESDAY, JULY 12TH. AFTERNOON SESSION.

Meeting called to order at 2 P.M. by the Chairman, Dr. C. R. HOLMES, Cincinnati.

Professor J. HIRSCHBERG (Berlin): Address (by special invitation).

The address consisted of a study of the history of the old Arabian ophthalmology, and would not lend itself to abstracting.

The Society gave a standing vote of thanks to Professor Hirschberg for his eloquent and learned address, and requested a copy for publication in the *Transactions* of the Section.

Dr. W. C. POSEY (Philadelphia): **The ocular symptoms of affections of the accessory sinuses of the nose.**

The general symptomatology, the writer said, was now well recognized, and attention was called to the less striking manifestations, and an endeavor made to perfect the ocular symptomatology. There was difficulty in diagnosing sinus affections by rhinologic examination alone. The ophthalmologist might render aid by early appreciating certain ocular conditions, such as œdematous infiltration of the optic nerve, shown by lowering of visual acuity or by defects in field of vision, and ophthalmologically by dilatation of retinal veins and choking of lymphatics around the central vessels. The significance of diminution in the light sense was referred to, and the orbital symptoms spoken of. The possibility of diagnosing the particular sinus affected was increased by noting the character of displacement of globe and position at which abscess points. There was a tendency for abscess of the frontal sinus to empty directly into the lachrymal sac. Palsy of the extraocular muscles, usually attributed to rheumatism, was not infrequently the result of sinusitis. Pseudo-migraine-ophthalmoplegique, conjunctival, corneal, and uveal symptoms, changes in refraction, asthenopia, headache, and neuralgia might all be due to affections of the accessory sinuses of the nose.

Discussion.—Dr. C. R. HOLMES (Cincinnati) said that you might separate the eye and the ear completely, in their study, but you cannot separate the accessory cavities of the nose from the eye, and he held that every oculist should be familiar with the diseases of the nose and accessory cavities. He had, as far back as 1896, published an article on "The Sphenoidal Cavity in

its Relation to the Eyes." He found in these chronic cases a daily rise of temperature, varying from one to two degrees, though to all appearance the people might be well. In ethmoiditis, the disease often pointed to the outer canthus. In sphenoidal cases, the pain was generally referable to the temple.

Dr. W. H. Snyder (Toledo) called attention to the fact that simply probing through the nasal cavity might not always bring pus, even where the sinus was affected; there might be no opening.

Dr. F. H. Hilscher (Spokane) believed there were a great many ophthalmologists who had neglected this subject; he had had many cases of this kind that had been in the hands of competent oculists, and had had cases where pus was not discovered but where there were pressure symptoms caused by the turbinates and septum.

Dr. S. D. Risley (Philadelphia) had been surprised, after his attention had been called to the important relationship of certain obscure affections of the eye and diseases of the sinuses contiguous to the orbit, at how frequently they occurred; when it was considered that these sinuses drain into the nasal cavities, and the frequency with which they become blocked, it was not so surprising. He had found choroidal disease frequent in these cases. He had recently had a case of exophthalmos of obscure origin where it was only after probing the frontal sinus on the affected side that the cause was discovered. Study of these obscure cases was never complete until the sinuses had been investigated.

Dr. Leartus Connor (Detroit) had observed these conditions for many years in a somewhat empirical manner, not only in the chronic organic lesions, but in conditions which had not reached that stage. It had been his habit for many years to investigate the sinuses in these obscure eye affections.

Dr. Edw. Jackson (Denver) referred to the difficulty of recognizing sinus disease, and had frequently referred such patients to expert rhinologists, and had them sent back with the report that there was nothing the matter. He had come to have more confidence in certain clinical associations of symptoms than in the ordinary rhinological examinations.

Dr. J. A. Donovan (Butte, Mont.) referred to the lack of accommodative power and defective vision in adenoid children, and thought the symptoms often due to pressure in ordinary congestive rhinitis.

Dr. J. A. Bradfield (La Crosse, Wis.) reported a case seen four months ago. A lady, of thirty-two, referred to him for supposed glaucoma, in which the trouble proved to be a large cystic middle turbinate.

Dr. Posey (in closing) said that it was not necessary to have pus to occasion these symptoms, but that simple congestion of the sinuses might occasion them.

Dr. A. E. Bulson, Jr. (Fort Wayne, Ind.): **The extraction of uncomplicated immature senile cataract.**

The speaker said that if the sclerosing process is interfered with there is a loosening up of the lamellæ and a molecular disintegration resulting in a cloudiness of the lens fibres,—called immature cataract when cloudiness does not extend throughout lens mass. This should be differentiated from the sclerosed lens of advanced years. Extraction of a fairly clear sclerosed lens is no more complicated than extraction of mature cataract. Extraction of immature cataract presented difficulties which often deterred operators, but ultimate results in uncomplicated cases properly operated on warranted the procedure when patient could not follow vocation and months might be required for complete opacification. The combined operation preferred, with large corneal section, and large opening in the capsule; objections to preliminary iridectomy, with or without effort to produce artificial ripening and extraction later, were that the double operation puts the patient to added risk which is unnecessary in order to accomplish satisfactory results, and the artificial ripening of immature cataract was not followed by sufficient advantage in the subsequent extraction to warrant its adoption. Difficulties in removal of soft lens substance were overcome by employment of irrigation of the anterior chamber with normal salt solution by Lippincott's method. Iritis, either from trauma produced by the irrigation or the swelling of remaining cortical substance, was anticipated by early and prolonged use of atropine. Dionin, in 5 or 10% solution, or occasionally in fine powder, immediately after closure of corneal wound to promote resorption of lens debris, and by such practice secondary operations were very greatly lessened in number. Dr. Bulson reports satisfactory results in a large number of extractions of immature cataracts in his own practice, and gives the opinions of sixty-five prominent American operators who answered a letter of inquiry on the subject.

Discussion.—Prof. J. Hirschberg (Berlin) said that von Graefe

had advocated the extraction of unripe cataracts, he had followed, and then the operation had been advocated by Schweigger. He did not advise the removal if the other eye was normal or had good vision.

Dr. S. D. Risley (Philadelphia) asked Prof. Hirschberg if he would consider it justifiable to remove a cataract, traumatic or otherwise, in a man at work among machinery, if the other eye were good, because of the danger in his work from the blind side, Prof. Hirschberg replying that he would.

Dr. Posey (Philadelphia) thought the paper would be the means of keeping a great many individuals from remaining blind unnecessarily, it being now the practice of a great many ophthalmologists to wait until the cataract is fully ripe. He had always followed Prof. Hirschberg's teaching to remove the cataract as soon as the vision in the good eye fell so low as to interfere with the ordinary duties of the person.

Dr. C. R. Holmes (Cincinnati) wished to substantiate what had been said with regard to the removal of unripe cataracts. It had been his practice for twelve or thirteen years to remove cataracts when the exigencies of the case demanded it.

Dr. Bulson, in closing, said that he had been surprised to find that a small percentage of prominent operators refused to operate on immature cataracts at any stage. He had grown to look upon iritis as one of the necessary complications of ordinary removal of immature cataracts; sometimes only a very slight reaction, and sometimes severe; never one that was not easily controlled by atropine and dionin.

Dr. John E. Weeks (New York): **Endothelio-cylindroma of the orbit, with report of a case. Removal with preservation of the vision and motility of the eye.**

Reference was made by the writer to reported cases of cylindroma and to the frequency of their occurrence. The histology and pathology of these growths were fully considered, and two cases reported. Taking into consideration the fact that these tumors contain hyperplastic tissue which develops largely from mesoblastic tissue, but that epiblastic tissue is always present and may preponderate, it was evident, the writer said, that the tumors are "mixed tumors." But, since the peculiar hyaline change that takes place in mesoblastic formations in these growths is often so striking a feature, he believed, with Verhoeff, that the term cylindroma should be retained.

Dr. F. S. Crocker (Chicago): **The prevention and cure of progressive axial myopia by appropriate treatment of the internal and external recti muscles, with report of cases.**

The writer spoke of the percentage of myopia found in European countries and its constant increase in this country. There had been no specific treatment used in the past for its prevention or cure. The author related his experience with prism exercise and pointed out the reasons for the poor results formerly obtained. Detailed description of the author's present method of using prism exercise and galvanism in the treatment of progressive myopia was given. The conclusions were that (1) the most important etiological factor in a very large number of cases of progressive myopia is an insufficient power of convergence; (2) that it is immaterial, in so far as the question of treatment is concerned, whether this inadequate converging power is the result of some anatomic defect in the shape or position of the orbit, or whether it is due to a fault in the insertion or innervation of the extrinsic ocular muscles; (3) that in all cases in which destructive fundus changes have not already resulted in too great a loss of vision, it is possible to check the progress of the myopia, or in the proper sense of the word effect a cure; (4) that in addition to the correction of the refraction errors, the eye muscles should receive due attention, and, when found defective, proper prophylactic treatment instituted or advised; (5) that for obvious reasons none but specially qualified legal practitioners of medicine should be allowed to prescribe glasses for, or in any way treat, myopia.

THURSDAY, JULY 13TH. MORNING SESSION.

Dr. Kaspar Pischel (San Francisco): **Rat-tail tendons for sutures in eye surgery.**

The speaker demonstrated his method of securing the tendons from the fresh rat-tail and said that they made strong, absorbable suture material. The absorbability of the sutures was, he said, especially in children, a great advantage.

Drs. W. A. Gamble and E. V. L. Brown (Chicago): **Iritis tuberculosa as diagnosed and treated by Koch's tuberculin.**

The authors reported the apparent cure of a marked case of iritis tuberculosa, with complete absorption of the nodes by the use of injections of small doses of Koch's tuberculin T.R. as advocated by Prof. von Hippel. They also obtained repeated

characteristic local and general reaction upon the use of 4 and 5*mg* doses for diagnostic purposes. The report is the thirty-fourth detailed report in the literature. The authors advocate very strongly the diagnostic use of tuberculin and recommend further attempts for therapeutic purposes.

Discussion.—Dr. A. E. Bulson, Jr., (Fort Wayne,) had had the pleasure to see the case and he had been one of the first to suggest the use of tuberculin for diagnosis. He advocated the use of larger doses for diagnostic purposes, 6–9*mg*. In his own case, the original dose had been 10*mg* in a child four months old. Keeping the temperature for three or four days previous to the use of the tuberculin was of importance, and the possibility of syphilis should also be taken into consideration.

Dr. C. H. Williams (Boston): **New test types made according to geometrical progression.**

The set of new test types had been made according to the geometrical progression first proposed by Dr. John Green, and lately recommended by the French Ophthalmological Society. It had a more complete series of letters with equal intervals between the different lines of letters, but preserved most of the Snellen lines and the shape of the Snellen letter. The lines of letters were arranged on slats so that they could be reversed and thus bring a fresh series of letters into view. The letters had been drawn with great care so that they did not vary more than 1/1000 of an inch from the calculated sizes. The letters were also lighted with a constant electric light to insure even illumination.

Dr. S. D. Risley (Philadelphia): **Subconjunctival salt injections.**

The writer said that subconjunctival injections of weak solutions of sodium chlorid were efficient and preferable to solutions of the salts of mercury. The method employed and the ocular affections in which the injections had proved useful were considered.

In the discussion Dr. Wm. Zentmayer (Philadelphia) said that while the injections produced no permanent disastrous results they did often cause disagreeable results.

Dr. L. H. Taylor (Wilkesbarre) asked if the immediate clearing of the cornea was permanent or only temporary.

Dr. John E. Weeks (New York) considered that the beneficial results were due to change in the circulation of the blood and lymph, as suggested by Dr. Risley.

Dr. A. E. Bulson (Fort Wayne) thought the reaction depended upon the depth of the injections, and considered the superficial injection, underneath the conjunctiva, just as efficient as the deeper ones. The reaction might also depend upon the frequency with which the injections were repeated. Some patients seemed peculiarly susceptible.

Dr. S. L. Ledbetter (Birmingham, Ala.) had given up the use of the mercury salts in favor of the normal salt solution, and found the results more favorable.

Dr. Leartus Connor (Detroit) thought the results depended not alone upon the relation of the fluids, but also upon the irritation of the nerves, and the reflex action upon the size of the blood-vessels and the rapidity of the currents through them.

Dr. Kaspar Pischel (San Francisco) thought that American patients did not stand the pain produced by the injections as well as the European patients, and that they complained much more frequently.

Prof. Hirschberg (Berlin) saw a great many American patients, and could see no decided difference between them and the European patients as to the manner in which they received the treatment. He used the injections exactly as did Dr. Risley, and in thousands of cases had not seen a single patient complain.

Dr. Wm. Zentmayer (Philadelphia): **Sympathetic inflammation following panophthalmitis.**

Harmlessness of panophthalmitic eyes was the generally accepted view until the publication of Alt's paper, in 1876. The reported cases were analyzed. Schirmer's opinion, based on two cases, was that a purulent plastic condition is present in panophthalmitic exciting eyes. This view was supported by Ruge, but later combated by Ahlstrom. The analysis of the reported instances tended to confirm the view of Schirmer. The author's case was one of panophthalmitis after cataract extraction, followed by sympathetic inflammation resulting in blindness.

Dr. T. W. Moore (Huntington, W. Va.): **Non-toxic amblyopia.**

The writer deemed it of advantage to consider the cases under three heads: amblyopia ex anopsia, hysterical amblyopia, and anæsthesia of the retina. The last was subdivided into two classes, those of unknown cause and those due to traumatism. Their differential diagnosis was considered. In the treatment of

amblyopia ex anopsia, the advantage of the convex-glass cure, according to Frommuller, was spoken of. In the treatment of the anæsthesias, the use of electricity and the values of the galvanic, faradic, and high-frequency currents were considered.

THURSDAY, JULY 13TH. AFTERNOON SESSION.

The following officers were elected for the ensuing year:

Chairman—Dr. L. H. TAYLOR, Wilkesbarre, Pa.

Vice-chairman—Dr. W. H. WILDER, Chicago, Ill.

Secretary—Dr. A. E. BULSON, Jr., Fort Wayne, Ind.

Member of House of Delegates—Dr. C. R. HOLMES, Cincinnati.

Dr. C. S. G. NAGLE (San Francisco): **Amblyopia caused by wood alcohol.**

The author called attention to eye symptoms and manifestations not referred to in the paper by Buller and Wood, and reported a case presenting certain peculiar features not previously mentioned in reported cases. Anatomically the blindness was due to ischæmia retinæ. He recommended iridectomy, or at least keratotomy, as lowering the intraocular tension and improving the circulation.

Dr. F. B. EATON (San Francisco): **Experimental and clinical evidence of dynamic (spastic) astigmatism. Practical conclusions.**

Difference of opinion on the subject the writer thought due to ignorance or doubt concerning essential facts. He referred to Dr. Geo. Martin's careful and exhaustive study of subjective symptomatology and the difficulty of studying his evidence owing to his method of marking his trial frame and astigmatic dial. In his clinical findings he referred to tonic (renitentes), clonic (elastiques), and resistant (resistantes) contractions. Martin disavowed intention to assume that these contractions are portions of ciliary muscle, but that its contractions sometimes rendered the lens more convex in some directions. The opposition of Geo. Bull and Tschering to Martin's views was commented upon and the support of Martin's views by Landolt, Javal, Dobrowolsky, and Eaton. Experiments, objective and subjective, on the author's own eyes: (1) evidence implicating the accommodative apparatus; (2) implicating the extraocular muscles. Necessity of the most complete cycloplegia possible was insisted upon.

In discussion, Dr. W. C. Posey (Philadelphia) thought the paper offered a satisfactory explanation of failure to relieve several cases he had had during the past year.

Dr. L. H. Taylor (Wilkesbarre, Pa.): **A case of melanotic sarcoma of the choroid.**

The author's patient suddenly developed hemorrhagic glaucoma, and the eyeball was enucleated on account of this condition. Microscopic examination showed pigmented sarcoma. There was no return in the orbit, but the patient subsequently died of sarcoma of the liver.

Prof. J. Hirschberg (Berlin) read a paper on a **contribution to the etiology of pigmented sarcoma of the choroid.**

The Society then adjourned.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE THIRD QUARTER OF THE YEAR 1904.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others.

Translated by Dr. PERCY FRIDENBERG, New York.

Sections I.–III. Reviewed by PROF. C. HORSTMANN, Berlin.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

367. GROENOUW, A., and UHTHOFF, W. **Relations of general and organic disease to changes and diseases of the eye.** *Graefe-Saemisch Handbuch der ges. Augenheilk.* Second revised edition. Leipsic, 1904, W. Engelmann.

368. SAEMISCH, TH. **Diseases of the conjunctiva, cornea, and sclera.** *Ibid.* Second revised edition. Leipsic, 1904.

369. SCHWARZ, O. *Encyclopædia of Ophthalmology*, Leipsic, 1904.

370. AXENFELD, TH. **Examination of the eye.** *Lehrbuch der klin. Untersuchungsmethoden.* Berlin, 1904, Urban D. Schwarzenberg.

371. CZERMAK, W. *Operations on the Eye.* Nos. 16, 17, 18, and 19, Vienna, 1904, K. Gerold Sohn.

372. LAGRANGE, F., and VALUDE, E. *French Encyclopædia of Ophthalmology*, vol. ii. *General Physiology of the Eyeball. Embryology. Teratology. Comparative Anatomy and Physiology.* Paris, 1904, O. Doin.

373. GLEICHEN, A. *Introduction to Medical Optics*, Leipsic, 1904, W. Engelmann.

374. NAGEL, W. *Human Physiology*, vol. iii. *Physiology of the Senses*, Part I. Brunswick, F. Vieweg and S., 1904.

375. v. Ewetzky, Th. *Communications from the Eye Clinic at Jurjew*, No. 2. Berlin, 1905, S. Karger.

376. Roemer, Paul. *Ehrlich's Theory of Immunity and its Importance in Medical Science.* Vienna, 1904, A. Hölder.

377. Bumke. *Pupillary Disturbances in Mental and Nervous Diseases.* Jena, 1904, G. Fischer.

378. Greeff, R. **Ophthalmic and hygienic school investigations.** Reprint from the *Klin. Jahrbuch.* Jena, 1904, G. Fischer.

379. Javal, E. *The Blind and their World.* Translated by J. Türckheim of Hamburg. Hamburg and Leipsic, 1904, J. Voss.

380. Heller, Theodor. *Psychology of the Blind.* Leipsic, 1904, W. Engelmann.

381. Nathanson, A. W. **The working power of the eye, its reduction as a result of injury, and its valuation.** (Conclusions.) *Westnik Ophthalm.*, 1904, No. 3.

382. Hanke, Viktor. **Diseases of the eye due to certain occupations.** *Samml. zwangl. Abh. a. d. Gebiete der Augenheilk.* Published by A. Vossius, vol. vi., No. 2, Halle, 1904.

383. Plehn, Ferd. *Johannes Kepler's Dioptrics.* Leipsic, W. Engelmann, 1904.

384. Pansier, P. *Magistri David Armenici compilatio in libros de oculorum curationibus Accanamosali et diversorum philosophorum de Baldach.* Paris, Baillière et fils, 1904.

385. Schultz, W. *The Color Perception of the Greeks.* Leipsic, J. A. Barth, 1904.

386. Hirschberg, J. **Delineations of the anatomy of the eye among the Arabs.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 289.

Groenouw (367) describes the affections of the eye in lepra and beri-beri, in tuberculosis, in acquired, constitutional, and hereditary syphilis.

Saemisch (368) finishes gono-blennorrhœa neonatorum, and then gives an exhaustive account of acute gonorrhœal conjunctivitis of adults and of gono-blennorrhœic conjunctivitis of infants. Croupous conjunctivitis is to be distinguished from diphtheritic clinically. A sharp distinction cannot be made between them bacteriologically. In croupous conjunctivitis the characteristic changes are found on the conjunctiva, in diphtheritic they lie in the parenchyma. Saemisch then describes the different forms of phlyctenular conjunctivitis, the histology of phlyctenulæ, their occurrence, etiology, and treatment. Then follows a description of pinguecula, of conjunctival indurations, of pterygium, of symblepharon, and of xerosis. Among the rare diseases of the conjunctiva are vernal catarrh, tuberculosis, syphilis, leprosy, vaccinia, that accompanying herpes iris, molluscum

contagiosum, conjunctivitis petrificans, ophthalmia nodosa, abscess of the conjunctiva, amyloid and hyaline degeneration, and pemphigus. Another chapter contains a discussion of chemosis, emphysema, ecchymosis, conjunctival hemorrhage, and tumors of the conjunctiva. Finally come the diseases of the semilunar fold and of the lachrymal caruncle.

The eleventh part of SCHWARZ's (369) *Encyclopädie der Augenheilkunde* contains in alphabetical order articles from koloboma to ligamentum pectinatum iridis.

AXENFELD's (370) article is a brief presentation of the way to make a clinical examination of an eye. He first describes the examination of the eye externally and of its adnexa, then tonometry and keratoscopy, then focal illumination, determination of refraction, skiascopy, and ophthalmoscopy, the testing of vision, of the color sense, the field of vision, the light sense, the motility and its defects, and finally the detection of intraocular foreign bodies, particularly bits of iron.

These numbers complete the work begun by CZERMAK (371) in 1893. This is beyond doubt the best and most complete work on the subject and no ophthalmologist should be without it. These final numbers contain the conclusion of cataract operations, operations in the vitreous, and on the retina.

The first article in the second volume of LAGRANGE and VALUDE's (372) *French Encyclopædia of Ophthalmology* by Professor Angelucci of Naples, on the general physiology of the eye, is a pattern of brevity and clearness. This is followed by a brief presentation of ophthalmo-tonometry by Sulzer. The next chapter on motor functions (movements of the iris, accommodation) and specific function is again the work of Angelucci. Van Duyse's article on the embryology and teratology of the eye deserves special mention as the best that has yet appeared on this subject. He publishes a series of very valuable investigations regarding the embryology and particularly the teratology of the eye, and a great part of the 371 illustrations are pictures of his own preparations. Fig. 42 presents a series of twenty sections of the first development of the eye. His presentation of the question of the genesis of the vitreous, which has recently been so much discussed, is a model of clearness and of scientific work. The same is true of the chapter on coloboma of the eye, which alone has 95 illustrations. His studies embrace not only the embryology

and teratology of the human eye, but also that of the eyes of the higher vertebrates. The list of literary references covers not less than 38 pages. Small, unimportant errors have crept in which may easily be corrected in another edition. Thus he speaks of Wicherkiewicz's ptosis operation when reference to the original shows it to have been an epicanthus operation.

The comparative anatomy and physiology of the motor apparatus of the eye is by Prof. Motais. Kalt treats of the comparative anatomy and physiology of the eye. In the description of the fundus of animals the work of Lindsay Johnson is quoted, and plates are reproduced showing the fundus of the horse and dog according to Nicolas and Fromaget, and of fishes according to Beauregard. Finally there is a short anthropological study by Kalt, in which are presented the differences in the orbits, the eyes and their adnexa, together with the predisposition to ocular disease in different races. SULZER.

GLEICHEN (373) states the principles of geometrical optics in their application to ophthalmology and presupposes for the student only a knowledge of the elementary principles of geometry and algebra.

The third volume of NAGEL's (374) *Human Physiology* is devoted to the physiology of the senses. Nagel himself deals with the subject of the specific sense energies; J. v. Kries, the psychology of sense. Then follows the sense of sight, Fr. Schenck dealing with dioptrics and accommodation, W. Nagel the action of light on the retina, and J. v. Kries the sensation of sight.

The second number of the communications from the eye clinic in Jurjew (Dorpat) published by EWETZKY (375) contains from the pen of J. Rubert "The Fundus Changes in Lepra"; of A. Engelmann, "Tonometric Investigations of Healthy and Diseased Eyes"; of Th. Wernicke, "Onkology of the Eye and Its Adnexa"; of Th. Wernicke, "Complete Congenital Bilateral Aniridia"; of G. Hollmann, "Changes in the Visual Field after Alcoholic Intoxication"; and of M. Sesülinsky, "Changes in the Visual Field after Poisoning with Nitrobenzol and Nitrogen Monoxide."

ROEMER's (376) book is a concise statement of Ehrlich's theory of immunity. It gives all important details and furnishes the reader a basis for judgment and so broad an outlook over the newest scientific standpoint that he can pursue the study through his own experimental work.

Bumke (377) gives an admirable presentation of the pupillary disturbances in mental and nervous diseases. He first describes the physiology of the pupillary movements, then the general pathology, and finally their special pathology.

Greeff (378) investigated the eyes of 1437 students. He found simple conjunctivitis in 60 cases, blepharitis sicca in 80, swollen follicles in 299, trachoma in none, 308 were hypermetropic or had hypermetropic astigmatism, 695 were emmetropic, and 879 were myopic. In 65 % of the myopes either the father or the mother was myopic, in 30 % the myopia was associated with posterior staphyloma; 316 of the 2874 eyes were astigmatic. Much of interest is also said regarding buildings, class-rooms, cleansing, heating, ventilation, quantity of air, lighting, and seats.

Javal (379), who became blind in his sixty-first year, gives advice how to render the life of the blind more agreeable.

Heller (380) has given himself the task of indicating some of the most important psychological problems of blindness and of showing that a solution of them is possible by means of immediate observation and experiment. First he gives a history of the science of teaching the blind, then speaks of the taste of the blind, of the association between the concepts from taste and hearing, the so-called distance sense of the blind, and their substitution of ideas.

Hanke (382) enumerates as consequences of direct injury by solid or gaseous substances, bad air and weather excluded, such forms of conjunctivitis and blepharitis as the conjunctivitis of workers among tulip bulbs, injuries of the cornea by bits of stone among stone-cutters, zonular opacities of the cornea among hat-cutters, masons, and grinders of steel, the characteristic opacity of the cornea among workers in nitro-naphthalin and aniline colors, the keratitis of oyster-shuckers, the trophic keratitis of caisson-workers, and the cataract of glass-blowers. Among the indirect injuries by way of the circulation belong in part the direct, toxic lesions of the optic nerve as a portion of the general symptoms of poisoning by carbon bisulphide, nitro-, dinitro-, and amido-benzol, and lead, in workers in rubber goods, in compositors, varnishers, potters, and painters. Neuropathic troubles appear in the form of the nystagmus of coal-miners, and the spasm of the orbicularis of the watchmaker.

PLEHN (383) has translated and published the work of Johannes Kepler explaining the action of the telescope. (Augsburg, 1611.)

According to SCHULTZ (385), the color perception of the Greeks is probably abnormal. There is a deficiency for pure blue and pure yellow. There exists for these colors no expression of single meaning. Indications, which are ambiguous, also suggest a confusion between blue green and violet.

HIRSCHBERG (386) gives an account of a delineation of the anatomy of the eye taken from the ophthalmology of the Halifa, about the year 1256.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND TREATMENT.

387. **Demararia, Enrique B.** Experimental researches regarding the antitoxic action of the tears against the toxin of diphtheria. *Klin. Monatsbl. f. Augenh.*, xlii., 2, p. 246.

388. **Berger, S.** Visual disturbance due to the application of hair dye containing aniline colors. *Arch. f. Augenh.*, l., p. 299.

389. **Birch-Hirschfeld.** The action of the Röntgen and radium rays upon the eye. *Arch. f. Ophth.*, lix., p. 229.

390. **Sesülinsky.** Disturbances of the visual field and poisoning with nitrobenzol. *Mittheil. a. d. Augenklinik Jurjew*, 1904, No. 2, p. 117.

391. FRANK, JOHANNES. **Intraocular use of iodoform in intraocular suppuration.** *Inaug. Diss.*, Giessen, 1904.

392. KRAUS. **Intraocular disinfection, with special reference to iodoform.** *Zeitschr. f. Augenheilk.*, xii., p. 97.

393. KOSTER GZN., W. **Some difficulties in the removal of foreign bodies from the interior of the eye.** *Ned. Tydschr. v. Geneesk.*, 1904, Bd. ii., No. 10.

394. WARSZAWSKY. **Extraction of fragments of iron from within the eye by means of the electro-magnet.** *Separatabdr. aus den Annal. der Gesellsch. der Aertze in Baku*, 1901–1902.

395. NICOLAI. **Transplantation of a rabbit's eye.** *Tydschr. v. Geneesk.*, 1904, Bd. ii., No. 11.

396. ENSLIN, E., and KUWAHARA, Y. **Purulent meningitis caused by enucleation of an eye.** *Arch. f. Augenheilk.*, l., p. 285.

397. GRAEF, C. **A case of anophthalmos.** *N. Y. Med. Jour.*, Sept. 3, 1904.

398. SNYDER, W. H. **Microphthalmos and congenital ankyloblepharon.** *Annals of Ophth.*, July, 1904.

399. JOHNSTON, R. N. **The bacteriology of panophthalmitis.** *Med. News*, Aug. 20, 1904.

DEMARARIA (387) finds that tears, even when the persons have been immunized with antitoxin, have no antitoxic effect on the toxin of diphtheria. As it can be only exceptionally that a

body contains more antitoxin than is given artificially, an antitoxic action of the tears against the poison of diphtheria cannot be reckoned on.

Berger (388) observed the appearance of a central positive scotoma in the left eye of a woman, thirty-six years old, after the use of a hair dye which contained aniline color. The papilla was reddened, the vision was $\frac{10}{100}$. Three weeks later, the scotoma had disappeared and the vision was normal.

Birch-Hirschfeld (389) has arrived at the following conclusions: The eye of a rabbit shows marked changes after an exposure to the Roentgen rays of the intensity and duration employed for therapeutic purposes. After about fourteen days, there appeared blepharitis, with loss of hair and lashes, conjunctivitis, keratitis, resembling interstitial both anatomically and clinically, and iritis. The inflammatory changes were shown anatomically to be disturbances of the epithelium of the skin of the lid, of the conjunctiva, and of the cornea, swelling and disintegration of the pigment cells of the iris, and changes in the walls of the vessels in the conjunctiva, lids, and iris. The lens always remained clear. Several weeks after the exposure, optic atrophy became demonstrable ophthalmoscopically. Anatomically there were degeneration and vacuolization of the ganglion cells of the retina, disintegration of the protoplasma-chromatin, shrivelling of the nuclei and cells, and marked disintegration of the nerve fibres. In human eyes, the Roentgen rays have caused loss of ciliæ, conjunctivitis, kerato-iritis, vacuolized degeneration of the intima of the vessel walls in the iris, ciliary body, and retina, degeneration of the retinal ganglion cells, and cystoid degeneration of the macula. Radium rays cause changes in the fine cellular structure of a retina freshly removed from the eye analogous to those observed after prolonged blinding in animals.

Sesülinsky (390) observed the appearance of a central scotoma after poisoning with nitrobenzol, a slight diminution of the central vision, a concentric contraction of the fields for color, and a relative central color scotoma after poisoning with laughing-gas.

Frank (391) reports seven cases of intraocular suppuration treated with iodoform introduced into the eye. In two cases the result was good.

According to Kraus (392), the action of iodoform on normal

and infected tissue when applied externally is faulty, both in experiments and in clinical experience. Theoretical considerations do not promise much for the successful intraocular use of iodoform, either in the vitreous or the anterior chamber. Neither the results obtained experimentally on rabbits' eyes nor the results of clinical observation favor iodoform therapy.

By means of the sideroscope, the various magnets, and the X-ray, one can remove many more foreign bodies from the eye than formerly. KOSTER (393) speaks of the sideroscope and of the value of radiography in making a correct diagnosis. He reports a number of cases which presented peculiarities. Particularly noteworthy are two, in which the pieces of iron within the eye had become magnetic, perhaps as the result of repeated examinations, perhaps otherwise, which caused perverted localization. In one, the sideroscope showed a large piece of steel, or iron, apparently located in the air to the temporal side and in front of the eye. In the other, it showed a piece of steel in the anterior part of the eye, while the radiogram showed that it lay deep in the orbit below the globe. JITTA.

Of the 746 pieces of iron in the eye described by WARSZAWSKI (394), only 18, 2.4 %, were intraocular, 5 in the anterior chamber, 2 in the lens, and 11 in the vitreous or retina. Removal was attempted in 16, and failed in 2, both in the vitreous. In 14 cases the foreign bodies were removed by means of magnets. The author considers the use of the magnet to remove the pieces of iron from the vitreous or retina to be indicated when the foreign bodies seem to be innocuous, the vision is preserved, and the eyes are unirritated, because dangerous symptoms often appear after a considerable lapse of time. An air bubble in the vitreous is considered evidence of the presence of a foreign body in the eye. HIRSCHMANN.

NICOLAI (395) grafted a rabbit's eye in the orbit of a patient immediately after enucleation, in order to obtain a better stump and to prevent the sinking in of the upper lid. It is recommended to transplant a flap of conjunctiva over the cornea of the rabbit's eye, to prevent too great mobility. There was only a slight shrinkage of the eye. JITTA.

In the case reported by ENSLIN and KUWAHARA (396) severe inflammatory symptoms appeared within an eye after traumatism. The eye contained masses of pyogenic streptococci. Through an

accident in the operation of enucleation the contents of the globe with the bacteria escaped into the wound, where the streptococci proliferated and travelled along the sheath of the optic nerve to the brain, where they set up a purulent meningitis.

JOHNSTON (399) concludes that the pneumococcus is the cause of panophthalmitis, although there are some cases of mixed infection with the staphylococcus and streptococcus. ALLING.

III.—INSTRUMENTS AND REMEDIES.

400. CLAIBORNE, J. H., and COBURN, E. B. **Experiments to determine the value of collargolum and antistreptococcic serum in infected wounds of the eye.** *Med. News*, Aug. 6, 1904.

401. LIPPINCOTT, J. A. **A new modification of the author's anterior chamber irrigator.** *Amer. Jour. of Ophth.*, July, 1904.

402. OPPENHEIMER, E. H. **Use of suprarenal preparations.** *Deutsche med. Wochenschr.*, 1904, No. 41.

403. POLTE. **Paranephrin, a new suprarenal preparation.** *Arch. f. Augenheilk.*, li., p. 54.

404. BIRNBACHER, A. **Trigemin.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 324.

405. SCHOUTE, G. J. **Observations with the orthoscope.** *Ned. Tydschrift v. Geneesk.*, 1904, Bd. ii., No. 11.

Experiments undertaken by CLAIBORNE and COBURN (400) did not show that collargolum or antistreptococcic serum exerted any favorable influence on purulent processes in the eyes of rabbits. ALLING.

In an advanced case of iritis with occlusion and seclusion of the pupil, OPPENHEIMER (402) used hemisine with a good result, a large portion of the posterior synechiæ becoming detached.

Paranephrin is a new preparation of the suprarenal capsule put forward by Merck. After instillation of one drop of a 1:1000 solution in a normal conjunctival sac, POLTE (403) observed the conjunctiva become pale. The smallest vessels disappeared completely; the larger ones became smaller. The maximum effect was obtained at the end of two minutes, was maintained fifteen minutes, and then slowly passed away. The therapeutic use of paranephrin is the same as that of other suprarenal preparations.

BIRNBACHER (404) successfully used trigemin in ciliary pain.

Shoute (405) uses Czermak's orthoscope with Gronholm's modifications. When by means of this apparatus the refraction of the cornea is done away with it is possible to project on the retina of the eye, which has become highly hypermetropic, clear pictures with glasses of varying refraction, if the distance between the orthoscope and the correcting lens is changed. It is possible in this way to obtain a clear image with all glasses between 20 and 2 D. The distances vary from 1.5 to 50*cm.* Compared with the image of the other eye the enlargement is from 1.9 to 20. A series of mathematical calculations and deductions gives as a provisory result the possibility of determining the refractive index of the aqueous. Jitta.

Sections IV.–VII. Reviewed by Dr. G. ABELSDORFF, Berlin.

IV.—ANATOMY.

406. Holmer, W. **The structural elements of the rods and cones of the retina of the frog.** *Anatom. Anzeig.*, xxv., 4, p. 102.

407. Wernke, Th. **Anatomy of the lachrymal sac, with special reference to its glands.** *Westn. Ophth.*, 1904, No. 5.

Holmer (406) fixed the retinæ of frogs by injection of a four-per-cent. formol solution into the vessels and then treated them with nitrate of silver according to Bielschowsky's method. Every section showed in all the outer contour of the rods and cones an excentrically placed fibril impregnated with metal, which extended as delicate fibres into them. Probably this was a hitherto non-differentiated portion of the perceptive elements.

Wernke (407) investigated by series of sections fourteen normal lachrymal sacs and found glands in eight, fifty-seven per cent., though other authors have observed them in only eight per cent. He thus sums up his results: 1. Follicles with indistinct margins present in three. In these cases catarrhal changes also were present. 2. In no case was ciliated epithelium present. 3. The epithelium of the lachrymal duct is of two or three layers. 4. A formation which may be designated sinus Maieri was seen twice. 5. No fold of Rosenmüller was seen unless accidental folds at the openings of the canaliculi are thus designated. 6. There are many folds and depressions in the mucous membrane of the lachrymal sac, and there is therefore no reason to designate any

one of them as the plica Rosenmülleri. 7. In the lachrymal sac there exist the following glands: (*a*) groups of tubular mucous glands, 0.3–1.5–2*mm* broad, sharply defined, the excretory ducts lie close together; (*b*) small, not sharply defined, scattered tubular mucous glands with few excretory ducts; (*c*) simple tubular glands in the mucous membrane; (*d*) gland-like depressions, the result of pathological processes. In one case they were found in the canaliculi. HIRSCHMANN.

V.—PHYSIOLOGY.

408. HEINE, L. **Binocular perception of depth on the basis of double images.** *Arch. f. d. ges. Physiol.*, 104, p. 316.

409. LEHMANN, A. **Irradiation as the cause of geometric optic illusions.** *Ibid.*, 103, p. 84.

410. SCHENK, F. **Intermittent stimulation of the retina.** *Ibid.*, 104, p. 343.

411. BIETTI, A. **Entoptic appearance during strong expiration and its cause.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 213. (Confirmation of Hess's explanation of this phenomenon as due to pressure of the vorticose veins on the retina.)

412. RAEHLMANN, E. **Abnormal sensation of simultaneous contrast and the lower amount of stimulus required** (Reizschwelle) **for colors in disturbances of the color sense.** *Pflüger's Arch.*, 102, p. 543.

413. KAHN, R. H. **The influence exerted by vascular dilatation in the retina.** *Centralbl. f. Physiol.*, No. 6, p. 153.

414. PILTZ, J. **A new apparatus for photographing the pupillary movements.** *Neurol. Centralbl.*, Nos. 17 and 18, pp. 801, 853.

415. HERTEL. **The influence exerted on the organism by light, especially by the chemically acting rays.** *Zeitschr. f. allgem. Physiol.*, iv., 1. p. 1.

416. NUËL, J. P. **Who was the first to demonstrate experimentally the inverted images of visible objects on the retina?** *Arch. d'opht.*, xxiv., 8, p. 502.

417. NUËL, J. P. *Vision*, Paris, O. Doin, 1904. 376 pages, 22 illustrations.

418. VENNEMAN. **The nutrition of the eye.** *Bull. de la Société belge d'Ophtalmologie*, 1904, No. 16.

In HEINE's (408) experiments a white object is placed at a point of binocular fixation. A pair of glasses, one red, the other green, is placed before the eyes of the person experimented on, so that one eye perceives a red, the other a green image, of the size of the white object. It is then impossible to perceive whether the double images are caused by one white object or two colored ones. The person experimented on thinks he sees only one object right and left of the fixation point.

According to RAEHLMANN (412), many persons have an imperfect color sense which pertains to neither red nor green blindness, and does not correctly correspond to the more modern designation, "anomalous trichromates." The single abnormality of such persons frequently consists of an enlargement of the stimulus threshold and an abnormal simultaneous contrast to colored lights.

KAHN (413) increased the arterial blood-pressure in rabbits and cats by injections of suprarenal extract or strychnine, or by dyspnœa, and then observed a passive dilatation of the retinal vessels. Irritation of the peripheral end of the cervical sympathetic caused in rabbits contraction of the retinal arteries, in cats a passive dilatation of the veins through venous stasis, in monkeys it was without effect.

PILTZ (414) uses a camera in which the film is rolled on a cylinder moved by clockwork. A chronoscope records the duration of the observation and of the pupillary movement. The exposures are made in ordinary daylight. His observations show that in healthy persons between forty and fifty years old the period of latency of the direct reaction to light is from 0.2 to 0.3 of a second, that the maximum contraction of the pupil is reached 0.9 of a second after the beginning of the light stimulus, and that the secondary dilatation takes place after 3.1 seconds.

HERTEL'S (415) biologic researches are of no special ophthalmological, though of great general interest. By means of ultraviolet light of two hundred and eighty magnesium lines he was able to kill bacteria in less than a minute. The toxin of diphtheria lost its power when exposed to these rays, as proved on guinea pigs, but antitoxin was not influenced by it.

NUËL (416) shows that Descartes rather than Scheiner was the first to demonstrate the inversion of visual objects on the retina. Mauthner ascribed this honor to an anonymous writer, but this writer was Descartes. V. MITTELSTÄDT.

NUËL'S (417) work on the physiology and psychology of vision is a valuable contribution to the "Bibliothèque internationale de psychologie expérimentale et pathologique," edited by Toulouse. It is a strong presentation, accompanied by many new ideas of our knowledge of these subjects. Perhaps a third of the work is

devoted to the visual act of animals. The second section is devoted exclusively to human vision. Whoever reads this book through must agree with the author, who thinks that in many departments of physiological optics an exaggerated importance has been given mathematics to the neglect of occurrences in the nervous apparatus. Chapters which deserve special notice are those on the projection of visual perception into the outer world, the horopter, binocular vision and diplopia, estimation of distance, examination of objects, and perceptions of light. An advocate of the empirical theory of light would find in Nuël an energetic opponent whose views agree with those of Hering, Mach, and Reddingius. For the most part the author goes his own way uninfluenced by the views of other writers in his explanation of the physiology of vision. BERGER.

The views held by VENNEMAN (418) regarding the metabolism of the eye differ from those held by other authors. He claims that the eye is nourished by means of the arterial capillaries from which the blood passes into the venous capillaries and the lymph into the lymphatic capillaries. He finds no lymph vessels in the eye and even denies the existence of the perivascular lymph spaces in the choroid described by Sattler. Both chambers of the eye and the suprachoroidal space are in his opinion large serous cavities and not lymph spaces. These anatomical peculiarities of the eye explain why local tuberculosis does not spread through the lymph channels, as in other parts of the body, and why the tubercle bacilli die in the part of the eye where they occur without producing general infection. There are three varieties of fluid in the eye: blood plasma, tissue fluid, and aqueous. The latter contains only those constituents of the blood which easily pass through the vessel walls: salt, glucose, ferments, easily diffusible albuminoid substances, toxins, and proteolysine. Blood albumin appears in the intraocular fluids only when the vessel walls are diseased. The intraocular tension is dependent on the osmosis between the three intraocular fluids. The tension of an enucleated eye is reduced because the vascular pressure is gone. If an enucleated eye is placed in distilled water the tension rises again on account of the osmosis of water into the eyeball. If the eye is placed in a 2 % salt solution, on the other hand, it becomes softer on account of the exosmosis. Fontana's space he considers not the filtration angle, but the osmosis angle of the eye. BERGER.

VI.—REFRACTION AND ACCOMMODATION.

419. Seggel. **Impairment of the light sense in myopes.** *Arch. f. Ophth.*, lix., 1, p. 107.

420. Hamburger, C. **The anatomical and physiological bases for Professor Stilling's theory regarding the origin and signification of myopia.** *Zeitschr. f. Augenheilk.*, xii., 2, p. 351.

421. Frenkel, H. **Myopia with corneal opacities.** *Annales d'ocul.*, cxxxii., p. 179.

422. Baslini, C. **Ophthalmometric inquiries.** *Arch. d'opht.*, xxiv., 9, p. 565.

423. Lintkewitsch, A. G. **Results of the operative treatment of high myopia at the University eye clinic at Moscow.** *Dissertation*, Moscow, 1904.

Seggel (419) has investigated the light sense, the differences in sensibility, and the amount of stimulus required to produce a sensation in 281 myopes. The females had better light sense than the males. The light sense is worse in myopia than in other refractive conditions, and the percentage of myopes with normal light sense is small as compared to that of emmetropes. The higher the myopia the worse is both the light sense and the visual acuteness.

Hamburger's (420) deductions are opposed to Stilling's theory that the superior oblique causes myopia by pressure on the eyeball during reading in cases in which the trochlea is placed deeply in conformity with a low orbit. First, he points out how inexact are measurements of the orbit in living persons; second, that the evidences in favor of the dominating rôle of the superior oblique are weak. If one investigates eyes which are not in a cadaveric, softened condition, but have been raised to the normal tension by injection of water into the vitreous, the groove described by Stilling as due to the compression of the superior oblique is never present. This groove is a cadaveric appearance of the softened globe. Furthermore, if the separate muscles are drawn upon, not by the hand, but by weights pulling in the direction of action of each muscle without distortion of Tenon's capsule, and if the compression is measured, not by the formation of furrows, but manometrically, the result is that the action of the oblique muscles not only does not surpass, but is markedly inferior to that of the other muscles.

Frenkel (421) finds that corneal opacities in one third of the cases cause progressive axial myopia with fundus changes.

Bilateral opacities, in the pupillary portion of the cornea, produce bilateral myopia, unilateral myopia on the affected side alone. The opacities usually cause a corneal astigmatism of 1.5 to 2 D, which forms another factor in the production of myopia. The vision is impaired by the opacities, and is later still more impaired by the fundus changes which accompany the myopia. Frenkel assumes that the cases of unilateral myopia associated with corneal opacities can be quoted as evidence in favor of the accommodation theory of myopia, yet believes that in many cases a pathological process in the anterior portion of the globe may cause sclerochoroiditis posterior, or intraocular tension with increased resistance of the cornea and stretching of the posterior wall of the globe may play a part in the pathogenesis of myopia in consequence of corneal opacities. BERGER.

BASLINI (422) has investigated the curvature of the cornea with special reference to the flattening of its periphery, which is never sufficient to compensate for the spherical aberration. Numerous tables illustrate the relation of the central refraction of the principal meridians to that of the marginal parts, that of the central astigmatism to the supplementary peripheral and the total, as well as that of the astigmatism found ophthalmometrically to the subjective, in which the size of the pupil is of influence. V. MITTELSTÄDT.

LINTKEWITSCH'S (423) work contains an exhaustive review of the literature on the operative treatment of myopia, the clinical histories of 110 operations, an analysis of the same, with numerous tables and diagrams. His conclusions are:

1. In considering the indications for the operative treatment of myopia, not only the degree of myopia but also the ability of the patient to work should be taken into account. Operation is indicated only when glasses cannot be worn, there is asthenopia, and the patient is thereby incapacitated for work.

2. The fear expressed by many writers that the capacity for near vision is lessened after operation is unfounded.

3. The danger of infection is important, especially in children.

4. The eye operated on is greatly predisposed to detachment of the retina.

5. To people who perform severe physical labor, it is better to refuse the operation, because after the operation, hard work, especially in a stooping position, is apt to cause detachment of the retina.

6. The operation for myopia is not a prophylaxis against detachment of the retina.

7. Loss of vitreous and incarceration of the vitreous are the principal causes of post-operative detachment of the retina.

8. The claim made by Fukala and Vacher that progressive myopia is arrested by the operation is not confirmed. The progress of the myopia is to be recognized rather from the ophthalmoscopic changes in the fundus than from the post-operative direct change of the refraction. The former can be demonstrated after from eight to twelve months, the latter not before two, three, or four years.

9. In high myopia, anomalies of the corneal refraction are frequent and often important.

10. A high degree of corneal astigmatism is more frequently met with in high myopia than in other forms of refraction. The same is true of perverse astigmatism.

11. The administration of iodine salts after discission of the clear lens induces a slower swelling of the lenticular mass, and guards against an attack of acute glaucoma.

HIRSCHMANN.

VII.—MUSCLES AND NERVES.

424. POSEY, W. C. **Paralysis of the upward movement of the eyes.** *Annals of Ophth.*, July, 1904.

425. WOOD, C. A. **Lipoma of the external rectus muscle.** *Ophth. Rec.*, Sept., 1904.

426. COLBURN, J. E. **Partial fixation of the globe for improvement of vision in certain cases of nystagmus.** *Ibid.*, Aug., 1904.

427. MARINA. **The contraction of the pupil which occurs in the eye drawn toward the mesial plane in co-ordinate lateral movements of the eyes.** *Neurol. Centralbl.*, No. 17, p. 797.

428. AENSTOOTS, C. **The reaction of the pupil during closure of the lids.** *Inaug. Dissert.*, Giessen, 1904.

429. REICHARDT, M. **The spinal cord in reflex immobility of the pupil.** *Arch. f. Psychiatr.*, 39, 1, p. 1.

430. DONATH, J. **Examination and reactions of the pupil.** *Monatsch. f. Psychiatr. und Neurol.*, xvi., supplement. (An abstract of the literature on the anatomy, physiology, and pathology during the past year.)

431. BONDI, M. **Cases of hysterical paralysis of the ocular muscles in one family.** *Prag. med. Wochenschr.*, 1904, No. 33.

432. DE WECKER, L. **Surgical treatment of paralytic strabismus.** *Arch. d'opht.*, xxiv., No. 7, p. 427.

433. LANDOLT, E. **Reply to de Wecker's article on surgical treatment of paralytic strabismus.** *Ibid.*, p. 425.

434. Brissaud and Pechin. **Ocular hemiplegia.** *Ibid.*, p. 428.
435. Blagoweschtschensky, M. **Operative treatment of concomitant strabismus by Panas's method.** *Dissert.*, Moscow, 1904.

The two cases reported by Posey (424) showed paralysis of the upward movements of both eyes. In one case there was in addition complete paralysis of convergence and limited motion in the other directions, especially downward. In the other the movements were normal save in the upward direction. The author locates the lesion in the region of the corpora quadrigemina.

Alling.

Lipomata arising from the fat cells within the sheath of a muscle are among the rarest of innocent tumors according to Wood (425). He describes a lipoma originating in the adipose tissue within the capsule of the external rectus muscle.

Alling.

Colburn (426) sutures the external rectus to the outer wall of the orbit in cases of nystagmus and obtains decrease in oscillations and improvement in vision. Alling.

Marina (427) observed in six out of two hundred cases that during lateral movements of the eyes the pupil of the adducted eye would contract, though in other respects the condition of the eye was normal. This observation is little in unison with the prevailing opinion that the contraction of the pupil during convergence depends on a concomitant innervation of the centres of the sphincters.

Aenstoots (428) gives an exhaustive review of the literature on the contraction of the pupil during closure of the lids, and reports three cases observed in the eye clinic at Giessen in which pupils which did not react to light contracted when the lids were closed and dilated when they were opened. It is noteworthy that in one patient closure of the right eye caused the left pupil to contract, showing that the reaction was consensual.

Reichardt (429) has examined the conditions of the pupils in a great number of paralytics during life and investigated the spinal cords after death. In all patients with rigidity of the pupils he found degeneration between the columns of Goll and the cuneate funiculus, in Bechterew's intermediate zone, most clearly marked in the ventral part at the level of the third and second cervical segments. On the contrary in paralytics with normal pupils a greater or less number of healthy fibres could be

demonstrated in the intermediate layer of the upper part of the cervical cord. Hence the author believes that reflex immobility of the pupil is a symptom of disease of the spinal cord, especially as the investigation of the anterior corpora quadrigemina in several paralytics with fixed pupils in search of an explanation of that condition gave negative results.

Bondi (431) observed abducens paralysis in the mother, ptosis in the daughter. The paralysis of the abducens passed from the left eye over to the right, in which there was a contracture of the internus. In the twelve-year-old daughter a spastic ptosis of the left eye appeared as the result of a fright and was cured by galvanism. These were apparently only simulated paralyses from hysterical muscle contractures.

de Wecker (432) believes tenotomy of the antagonist of the paralyzed muscle is indispensable and that it alone is sufficient in cases where a concomitant strabismus persists after recovery from the paralysis. In other cases he combines it with advancement of the paralyzed muscle. v. Mittelstädt.

Landolt (433), on the other hand, disapproves of the tenotomy of the antagonist of the paralyzed muscle because he considers it ineffective, and because it artificially weakens the muscle.

v. Mittelstädt.

Brissaud and Pechin (434) describe the clinical picture of conjugate deviation due to paralysis of the lateral muscles which they term ocular hemiplegia. The eyes can turn either to the right or to the left and to the middle line, and are deviated in accordance with the changed muscular tension without spasm of the antagonists of the paralyzed muscles. They report a typical case in which there was a left-sided facial paralysis and the eyes could be moved to the left only as far as the middle line.

v. Mittelstädt.

Blagoweschtschensky's (435) work is divided into five parts, the first of which is devoted to tenotomies, the second to advancement, the third to operations on Tenon's capsule, the fourth to experimental researches, and the fifth to clinical observations. The experiments were to study the stretching of muscles before tenotomy. In one series of experiments on rabbits one muscle was stretched with a weight varying from 20 to 120*gms*, for five minutes immediately before tenotomy. The corresponding muscle in the other eye was tenotomized without stretching as a con-

trol. After healing, the animals were killed and the distance of the attachment of both muscles from the cornea and from the optic nerve carefully measured. In all cases, with a few exceptions in which the muscle had been overstretched, the attachment of the stretched muscle was farther from the corneal margin than that of the other. Moderate stretching of a muscle excites it to contraction so that it remains for some time shorter and thicker. After overstretching, on the contrary, the muscle is longer and thinner.

In another series of experiments the author sought to prolong the retraction of the muscle after tenotomy by irritation with hot water, Pacquelin, or electricity. The same results were obtained.

The clinical part is devoted to cases operated on according to Panas's method. This operation was performed 120 times on 92 patients. In 17 cases a simple tenotomy was performed on the second eye. The effect of a tenotomy with stretching of one internus varied from 12 to 40°, average 20.7°, that of tenotomy with stretching of both interni from 28 to 50°, average 37.6°, that of tenotomy of each internus with stretching of one but not of the other from 27 to 65°, average 34.9°. Tenotomy of one externus with stretching produced an effect of from 6 to 25°, average 17°, that of both externi 15 to 40°, average 25.4°. The average effect of one simple tenotomy of the internus is given as 16.3°, of a double 29.3°, of one externus 12.5°, of both externi 22.4°. The general conclusions are that the stretching of the muscle in Panas's operation is a mechanical irritation which causes contraction of the muscle and so attachment at a greater distance from the cornea. The necessary force and duration of the stretching is not yet settled. The effect of a tenotomy with stretching always exceeds that of a simple tenotomy. Every tenotomy exercises an influence over the radius of curvature of the corresponding corneal meridian and so affects the astigmatism, but the author has not been able to discover the rule governing this action. HIRSCHMANN.

Sections VIII.–XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

436. COBURN, E. B. **Associated movement of the upper eyelid and lower jaw.** *Med. Record*, Aug. 13, 1904.

437. Pes, O. **Acute gangrenous phlegmon of the lids.** *Zeitschr. f. Augenheilk.*, xii., p. 438.

438. Jurintschek. **A case of syphilitic tarsitis.** *Ibid.*, p. 376.

439. Kuhnt, H. **Control of bleeding after operations on the lids in hæmophiles.** *Ibid.*, p. 390.

440. Van Schevenstein. **A new operation for epicanthus.** *Soc. Belge d'Opthal.*, April 24, 1904.

441. Enslin, E. **A case of melanosarcoma of the lower lid.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 109.

The case of Coburn (436) showed complete ptosis except that the upper lid could be raised by opening the mouth. Cases of similar nature in literature are cited and classified in appropriate groups. Alling.

Pes (437) finds that most published cases of acute gangrenous phlegmon of the lids, excluding the carbuncle of anthrax, contained the streptococcus pyogenes. He reports three cases of traumatic origin: the first, with streptococci, ran a relatively benign course, the second, with staphylococci, ran a severer course, while the third, which was bacteriologically negative, spread over the orbit, produced general sepsis, and was fatal.

Jurintschek (438) describes the course of a tarsitis in a woman thirty-eight years old who presented symptoms of syphilis. The lid affection was painless, and developed in the course of six months. The lids were œdematous and the four tarsi could be distinctly felt to be enlarged. The palpebral fissure finally became deformed. Under the influence of a short course of antisyphilitic treatment the lids were restored to the normal condition, a faulty escape of tears alone remaining. There was no disturbance of the conjunctiva.

After the failure of many other means to check bleeding after an operation for trachoma Kuhnt (439) applied compression by means of instruments resembling Vidal's serresfines.

Van Schevenstein (440) introduces two threads 3*mm* from the fold of skin in epicanthus, carries them subcutaneously in a horizontal direction, and brings them out over the root of the nose. By tension on these threads the epicanthus is obliterated. The threads must be left *in situ* several weeks that the subcutaneous scar formation may produce a permanent effect.

Berger.

The tumor found by Enslin (441) in the lower lid of an old woman appeared through the skin as a small, hard lump of

uniform dark brown color. On the conjunctival surface it projected freely as a cauliflower growth. A neighboring, small, light brown nævus was unconnected with the tumor. At the operation there were found two other black tumor nodules.

IX.—LACHRYMAL APPARATUS.

442. Jackson, Edw. **Traumatic dislocation of the lachrymal gland, with foreign body in the orbit.** *Ophth. Record*, Aug., 1904.

443. Shoemaker, W. T. **A case of bilateral enlargement of the lachrymal glands.** *Annals of Ophthal.*, July, 1904.

444. Demaria, H. B. **Experiments regarding the antitoxic action of the tears against the toxin of diphtheria.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 246.

445. Giulini. **Fibrosarcoma of the lachrymal gland.** *Deutsche med. Wochensch.*, 1904, No. 30.

446. Aubaret. **The radical cure of dacryocystitis of nasal origin.** *Annales d'ocul.*, cxxxii., p. 81.

Jackson (442) describes the case of a man who was thrown from a wagon and struck upon his head receiving a wound of the upper lid parallel to the orbital margin. The wound, which was sutured, healed by first intention but redness and swelling persisted. The eyeball was displaced forward about 12*mm*, downward 4*mm*, and inward 3*mm*. There was a hard mass in the outer two thirds of the upper lid which proved to be the dislocated lachrymal gland. This was excised but the wound later opened and at various intervals a number of pieces of wood were extracted from the orbit. Records of thirteen cases of traumatic dislocation of the lachrymal gland were found.

Alling.

Shoemaker (443) relates a case of bilateral hypertrophy of the lachrymal gland of four years' standing. He is disposed to classify it among those cases occurring in the course of systemic diseases. Profound anæmia was present in this case. There was also a possibility of syphilis. A review of our present knowledge of affections of the lachrymal gland is incorporated in the paper. Alling.

Demaria's (444) results show that human tears are not antitoxic even when the persons have been immunized against diphtheria.

According to Giulini's (445) account the tumor was almost as large as an apple and had severely pressed upon the eye for

three years. The latter recovered almost completely after removal of the tumor.

Aubaret (446) emphasizes the frequency of nasal diseases, particularly of the lower end of the lachrymal canal, in various forms of dacryocystitis. For a radical cure the author advocates extirpation of the lachrymal sac with perforation of the lachrymal bone so as to form a direct communication with the ethmoid cells and the nasal cavity. A strip of gauze is passed through this perforation and removed after two days. He considers that there is a certain analogy between sinus diseases and dacryocystitis and recommends this method as analogous to that of Hogston-Luc and Caldwell-Luc in sinusitis. In the latter a perforation is made into the nasal cavity to provide a way for the escape of pus and to enable the skin wound to heal by first intention without the formation of a fistula. Berger.

X.—ORBIT AND NEIGHBORING CAVITIES.

447. Coulomb. **Moulding the orbit by the aid of liquefied paraffine.** *Annales d'oculistique*, 1904.

448. Besch, W. **Primary orbital sarcomata, particularly with the formation of cavities.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 94.

449. Onodi, A. **Disturbances of vision or blindness caused by diseases of the posterior accessory sinuses of the nose.** *Zeitschr. f. Augenheilk.*, xii., 1, p. 23.

Coulomb (447) describes an instrument which he has devised to inject paraffine into the orbit in such a way as to enable it to retain an artificial eye in position. Similar methods have been tried by Coppez and Domec, but with not as satisfactory results. After the paraffine has been injected in this manner an artificial eye can easily be fitted. Berger.

Besch's (448) work deals with a case of sarcoma with a large central cavity which was placed in the muscular funnel and removed by means of Krönlein's operation. The eye had been troublesome for a year and a half. The diagnosis lay between a tumor of the optic nerve and an orbital tumor, situated in the funnel made by the muscles. The sarcoma was much pigmented, was composed of round and spindle cells, had a connective-tissue capsule, and contained a smooth-walled cavity.

Onodi (449) has enriched the slight literature on the subject of disturbances of the vision and blindness caused by diseases of

the posterior accessory sinuses by private communications from ophthalmologists. The local relations he makes very clear by illustrations, and draws attention to the close relation of the optic nerve not only to the sphenoid sinus but also to the posterior ethmoidal cells, and shows that visual disturbances may originate there. His observation shows the possibility that bilateral visual disturbance may result from unilateral disease of the posterior ethmoidal cells, as a large posterior ethmoidal cell is separated from the chiasm and from both optic nerves by a wall as thin as paper. It is well known that the posterior ethmoid cells are diseased in connection with the ethmoid labyrinth or the sphenoid sinus.

XI.—CONJUNCTIVA.

450. Veasey, C. A. **Brief report of a case of spring conjunctivitis resembling malignant growth of the corneal limbus.** *Amer. Jour. Med. Science*, May, 1904.

451. Brown, S. H. **Pemphigus of the conjunctiva, with report of a case.** *Annals of Ophthal.*, July, 1904.

452. Schieck, F. **The differential diagnosis between vernal catarrh and similar affections of the conjunctiva of the tarsus and of the limbus.** *Arch. f. Ophth.*, lix., p. 553.

453. Bruns, O. **Experimental production of inflammation resembling phlyctenular keratitis with dead tubercle bacilli.** *Arch. f. Ophth.*, lviii., p. 439.

454. Knapp, A. **Severe pseudo-membranous conjunctivitis in an infant, presumably due to the influenza bacillus.** Arch. of Ophth., xxxiii., 4, p. 386.

455. Knapp, A. **A bacteriological study of trachoma, with remarks on the occurrence of the influenza group of bacteria in conjunctivitis.** Arch. of Ophth., xxxiii., 5, p. 463.

456. Ahlström, G. **Subconjunctival lipomatous tumors.** *Beiträge zur Augenheilk.*, lxi., p. 1.

457. Ulbrich, Hermann. **The natural pigment spots and the pigment tumors of the conjunctiva.** *Zeitsch. f. Heilkunde*, xxv., 9, p. 260.

458. Terrien, F. **Subconjunctival cysticercus.** *Arch. d'opth.*, xxiv., p. 431.

The clinical and microscopic appearances of a tumor described by Veasey (450) resembled sarcoma, but proved to be spring catarrh, which was present in one eye two years and eight months before it appeared in the other. Alling.

Schieck (452) investigated the condition of the elastic fibres in the limbus swellings of conjunctivitis hyperplastica and in

pterygium, and is of the opinion that the layer of elastic fibres commonly found beneath the tunica propria of the conjunctiva shows no proliferation, but is only passively involved. Even in a trachomatous tarsus the process is not the same as in vernal catarrh, but acts over the layer of elastic fibres. The milky cloudiness of the conjunctiva tarsi in vernal catarrh, he ascribes, together with the tumor-like formations, to the characteristic proliferation and swelling of the elastic fibres. He does not believe that this process is of bacterial origin.

Dead tubercle bacilli produce at the place of application a clinical picture only slightly different from that of common tuberculosis. The histological changes closely resemble the miliary nodules produced by living bacilli. The bacilli remain in them for months colorless. But the nodules lack the power of inoculability, and it is still a question whether they become caseous.

Bruns (453) injected sterilized tubercle bacilli into the corneæ of rabbits, but produced no clinical picture in any way like that of phlyctenular keratitis. Injections of sterilized tubercle bacilli into the carotid produced, in half the cases, symptoms more or less similar clinically and anatomically to those of human phlyctenular conjunctivitis, usually at the limbus of the cornea, whence they disappear, leaving no trace. The experimental, so-called phlyctenulæ are smaller than the nodules met with in human beings, they never ulcerated, and never caused corneal changes. Only in a part of the cases were the bacilli found in these nodules.

Knapp, A. (454), observed in a child, six weeks old, and otherwise healthy, pseudo-membranous conjunctivitis with a thin, fibrinous secretion and involvement of the cornea, which, in one eye, went on to perforation. A bacillus was found in the secretion and identified with the bacillus of influenza.

Abelsdorff.

Knapp, A. (455), has examined 120 cases of trachoma bacteriologically. He found a bacillus identical with Müller's trachoma bacillus and similar to the influenza bacillus in 8 cases. It could not be differentiated from the true or the pseudo influenza bacillus. Probably its presence was accidental. There is an influenza conjunctivitis without other signs of influenza. The Koch-Weeks bacillus is not identical with the influenza bacillus.

Abelsdorff.

AHLSTRÖM (456) comes to the conclusion, based on the examination of two tumors removed from young persons, that subconjunctival fatty tumors are usually skin derivates, but that pure lipomata also occur. One of those examined contained a bit of bone. Each tumor was of the size of a large bean, and was situated between the superior rectus and the externus.

ULBRICH (457) in his comprehensive article brings together all kinds of conjunctival pigmentation and reports a new case. A man, sixty-one years old, had had for twelve years a black spot in the inner canthus which became so large that at the end of eight years the entire eye appeared to be black. Then a nodule formed at the margin of the cornea which in a few years extended from the middle of the cornea to the canthus. The other parts of the corneal margin were black with pigment. After enucleation the epithelium and the mucous membrane were determined to be the seat of the pigmentation. The diagnosis was nævus pigmentosus.

TERRIEN (458) removed from a girl fifteen years old a cysticercus situated under the conjunctiva of the upper part of the eyeball, where it appeared as a serous cyst of the size of a large bean with a whitish-yellow disc in its wall as large as a pea. The latter was formed from a proliferation of the subconjunctival tissue which formed a thick layer at the place where the cyst was attached to the sclera. No giant cells were found. It was a cysticercus cellulosæ in a very unusual position.

V. MITTELSTÄDT.

XII.— CORNEA, SCLERA, ANTERIOR CHAMBER.

459. EWING, A. E. **Bullous keratitis, fatty degeneration of Bowman's membrane.** *Amer. Jour. of Ophth.*, June, 1904.

460. WEEKS, J. E. **Deposit of silver in the epithelial layer of the cornea.** *N. Y. Eye and Ear Inf. Report*, Jan., 1904.

461. FEJÉR, J. **Œdema of the cornea in infants after delivery with forceps.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 235.

462. DEUTSCHMANN. **Nodular degeneration of the cornea.** *Beiträge z. Augenheilk.*, lxi., p. 14.

463. KLYKOW, L. A. **Keratitis solaris exfoliativa.** *Westn. Ophth.*, 1904, No. 5.

464. SCHIRMER, O. **Keratitis disciformis and keratitis postvaccinolosa.** *Arch. f. Ophth.*, lix., p. 133.

465. FEJÉR, J. **Two rare forms of corneal inflammation.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 202.

466. Martin, A. **A new case of keratomycosis aspergillina.** *Arch. f. Augenheilk.*, l., 3, p. 177.

467. Talichet. **Neuroparalytic keratitis after resection of the superior maxilla.** *Thesis*, Lyons, 1904.

468. Villard and Delord. **Contribution to the histological study of the cicatrization of a corneal wound made in paracentesis of the anterior chamber.** *Arch. d'opht.*, xxiv., No. 8, p. 515.

469. Roure. **An evanescent affection of the episcleral tissue.** *Annales d'oculistique*, cxxxii., p. 117.

470. Ewetzky, Th., and Kennel, J. **A larva of a fly in the anterior chamber.** *Zeitschr. f. Augenheilk.*, xii., p. 337.

Ewing (459) details the results of the microscopic examination of a glaucomatous eye which had developed bullous keratitis. He divides the process of vesicle formation into four stages. First he finds fatty degeneration of Bowman's membrane with elevation and thickening of the epithelial layer. The second step is the further degeneration of the anterior limiting membrane with involvement of the adjacent layers of the substantia propria. The basal epithelial cells have become absorbed. The third stage consists in the formation of a wall for the vesicle by increase in the epithelial cells. The last stage shows fibrin, wandering cells, and spindle cells in the vesicle with later the appearance of blood-vessels. Alling.

Weeks (460) has seen two cases in which, after the use of nitrate of silver in ulcer of the cornea, a black deposit was found in the corneal tissue. It is believed that the silver was deposited as the chloride and later reduced to the metallic state.

Alling.

Fejér (461) found in the eye which had been pressed upon by the forceps ecchymosis and a smooth, milky cornea three days after birth. The corneal cloudiness disappeared in eight days under the influence of warm compresses.

Deutschmann (462) saw in two old women with unirritated eyes degeneration of the cornea with the formation of coarse nodules and cloudiness of the tissues between them. Ulceration occurred in one eye. Erosion of the epithelium caused temporary improvement, but could not arrest the disease. He thinks these belong to the same class of cases as those described by Fuchs and Groenouw, and suggests the name "progressive nodular degeneration of the cornea."

Toward the end of March, with freshly-fallen snow and blinding sunshine, Klykow (463) observed a little epidemic,—fifteen

patients with similar symptoms: erythema of the skin, hyperæmia of the conjunctiva, slight ciliary injection, marked photophobia, and blepharospasm. There were excoriations and accumulation of epithelium horizontally over the middle of the cornea. The disease lasted four or five days. The superficial keratitis, as equivalent to the solar erythema of the skin of the face, he considers the primary symptom and holds all others to be secondary.

HIRSCHMANN.

SCHIRMER (464) claims that the keratitis disciformis of Fuchs is identical with the keratitis described by him as a disease consecutive to vacciniola of the conjunctiva and of the margin of the lid. He observed the disease in its very early stages, which, in vaccinal disease of the margin of the lid, appears first as an infection of the corneal epithelium and later of the parenchyma.

FEJÉR (465) observed a peculiar form of sclerotic keratitis in a woman forty-one years old. The etiology was not determined, but the author believes it was tuberculous. Another patient, suffering from gout, had frequently recurring keratitis with little ulcers, which furiously attacked sometimes one eye, sometimes the other, and always quickly passed away. The disease persisted four months. The corneæ were not rendered very opaque.

The aspergillus affection of the human cornea was easily treated by MARTIN (466) and was cured by mechanical removal. Its culture was extremely pathogenic for rabbits' eyes.

VILLARD and DELORD (468) eviscerated an eye for purulent iridocyclitis and found the corneal wound made four days previously closed by an epithelial plug which extended to the middle of the thickness of the cornea. The plug contained numerous intercellular spaces. The inner part of the wound was filled with leucocytes and a fibrous network. In the lateral part of the wound the epithelial plug was of irregular shape and permeated with connective-tissue elements the same as the contiguous cut surfaces of the corneal lamellæ. This tissue, containing fatty granular cells, grew from below toward Bowman's membrane, and between this and the epithelium, so that, gradually becoming thinner, it completely disappeared in the region of the newly formed connective-tissue which permeated the lamellæ of the cornea and which in a later stage extended to the middle of the wound and formed a firm cicatrix. The pus of the hypopyon came partly from the ciliary body, but chiefly from the much inflamed iris.

V. MITTELSTÄDT.

Ewetzky (470) writes that diseases of various organs due to flies are common in Russia. The flies lay their eggs or larvæ on and between the eyelids, especially at the inner canthus. The larvæ feed from the lymph vessels and veins and cause trouble in the lids, the orbit, and the eyeball itself, while general disease is sometimes produced. In the case reported the parasite was recognized in the form of a worm in the anterior chamber, whence it was removed with forceps. The eye was much inflamed. The larva had been in the eye over four months. How it entered could not be determined. It suffered decidedly in its development in the eye and caused little destruction.

Sections XIII.–XVIII. Reviewed by Dr. O. BRECHT, Stettin.

XIII.—LENS.

471. Wright, R. H. **Summary of cataract operations performed at the New York Eye and Ear Infirmary for the past two years ending September 30, 1903.** *N. Y. Eye and Ear Infirm. Report*, Jan., 1904.

472. Woodruff, H. W. **Report of a case of bilateral dislocation of the crystalline lens into the anterior chamber.** *Ophth. Record*, July, 1904.

473. Weiss, E. **Traumatic posterior polar cataract.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 268.

474. Wuillomenet. **Cataract and leucæmia.** *Soc. d'opht. de Paris*, June 7, 1904.

475. Corner. **Non-perforating wounds of the anterior capsule of the lens.** *Brit. Med. Journal*, 1904, p. 1311.

476. Wicherkiewicz, B. **Open treatment of the wound after extraction of cataract.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 222.

477. Kasass, J. J. **Removal of a fragment of a percussion cap from the lens with preservation of its transparency.** *Westn. Ophth.*, 1904, 5.

478. Hirschberg, J. **The sucking out of cataract, a radical operation of the Arabs.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 225.

479. Aubineau. **Ossification of the crystalline lens.** *Annales d'oculistique*, cxxxii., p. 100.

480. Peters, A. **Further contributions to the pathology of the lens.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 37.

481. Grilli, G. **Cryoscopy and pathogenesis of senile cataract.** *Rec. d'opht.*, xxvi., p. 321; *Bull. et mém. de la Soc. française d'ophtalm.*, May, 1904.

Wright (471) includes in his tabulated report 247 cases of cataract extraction; 120 were simple, 117 with iridectomy, 6 linear, 1 capsular, 2 high myopia, 1 congenital. There were 8 cases of iris prolapse, 2 intraocular hemorrhage, 7 panophthalmitis, 1 irido-cyclitis. Alling.

Cases of posterior polar cataract following traumatism are of special interest. Weiss (473) saw a sharply defined opacity of the outer portion of the posterior lens capsule after a perforating wound of the cornea by a piece of iron without visible injury of the anterior lens capsule. The opacity seemed to be composed of very fine brown spots like fine sand. The vision was $\frac{5}{20}$. The opacity cleared up in six weeks, when the vision was $\frac{5}{5}$. The case reported by Wintersteiner is then briefly quoted.

Wuillomenet (474) performed cataract extraction with iridectomy on a man sixty-nine years old. The iridectomy was followed by a severe hemorrhage, and the extraction by hemorrhages in the conjunctiva. A later investigation revealed swollen lymphatic glands and leucæmia, to which the hemorrhages were ascribed. Berger.

Wicherkiewicz (476) recommends after operations, when pressure should not be made on the eye, simple closure with strong brown silk paper. This procedure has advantages over bandaging and the modifications of the entirely open treatment.

In Kasass' (477) case a piece of percussion cap penetrated the cornea and iris and lodged in the lens. After its removal, together with the corresponding piece of iris, the eye recovered with good vision. At the place where the lens was injured there remained a circumscribed capsular opacity from which an opacity in the form of a nail passed through the lens to the posterior capsule, where it again expanded. The rest of the lens remained perfectly clear. Hirschmann.

Hirschberg (478) shows that the operation of sucking out cataracts recently recommended by Fiengal, Rogman, Coppez, Howe, O. Landau, and Terson is in principle the same as the one practised by the Arabs one thousand years ago.

Aubineau (479) describes two new cases of ossification in the form and position of the lens in atrophic eyes. In both cases the lens capsule could no longer be found. Berger.

Peters (480) found in each eye of a patient twenty-six years old, who had suffered from tetany and chronic nephritis and died of pulmonary tuberculosis, changes resembling those of lamellar cataract at the equator and in the posterior cortex of the lens, which had appeared clinically as a hazy opacity and stellate cortical cataract, together with vacuolization and swelling of the protoplasm of the ciliary epithelium, rarification of

the pigment in the pigment epithelium, swelling of the nuclei, and marginal fixation of the pigment granules. He considers this observation a fresh confirmation of the theory that tetany can produce cataract through injury of the ciliary epithelium.

Grilli (481) investigated by cryoscopy the urine of eighty patients with senile cataract and of sixty without. As the cryoscopic coefficient was increased in the former, he assumes that a sclerosis of the renal vessels is present in patients with cataract, which results in difficult renal excretion and increased blood tension. The lens, which obtains its nourishment by means of osmosis, may be surrounded by a hypertonic fluid drawing water from the lens, and this may be the cause of the formation of cataract. Berger.

XIV.—IRIS.

482. Moissonier. **Tuberculous iridocyclitis.** *Arch. d'opht.*, xxiv., No. 7, p. 438.

483. Tonfesco, Mlle. **Coloboma of the iris and choroid, congenital aphakia.** *Soc. d'opht. de Paris*, March 1, 1904; *Annales d'oculistique*, cxxxii., p. 107.

484. Meller, J. **Hyaline degeneration of the margin of the pupil.** *Arch. f. Ophth.*, lix., p. 221.

485. Hunter, D. W. **A case of tuberculous iritis.** *N. Y. Eye and Ear Infirmary Report*, Jan., 1904.

Moissonier (482) discusses the clinical picture of tuberculosis of the anterior portion of the eye. This is rarely acute, but usually appears as an exudative iridocyclitis with few signs of inflammation. Sometimes it involves equally the entire anterior section of the eye, sometimes it forms a circumscribed tumor of the ciliary body, and always goes on to perforation. Almost all the membranes are changed, but the iris and ciliary body in particular are permeated with embryonal cells and tubercles containing giant cells. Almost without exception the tension is reduced. Ocular tuberculosis is always transmitted from another part of the body, even when it is clinically primary. The theory of its primary generation is weak. In cases where the diagnosis is uncertain the tuberculin reaction should be tried. Treatment consists in enucleation of the eye before perforation has occurred, or exenteration afterward. v. Mittelstädt.

Miss Tonfesco (483) observed congenital aphakia and a coloboma of the iris and choroid of the right eye in a patient twenty-two years old, subject to hereditary syphilis. The hypermetropia

was 10 D, vision $\frac{12}{60}$, $\frac{4}{60}$ w + 10 D. After a study of the literature on the subject, she concludes that in most cases of congenital aphakia the lens was originally present, but had its development checked by pathological processes, or was absorbed. Only very exceptionally is there a want of development of the lens with abnormal processes in the embryonal ectoderm.

BERGER.

MELLER (484) found hyaline degeneration of the pupillary margin in four patients previously described by Fuchs (*Arch. f. Ophth.*, xxxi., 3, p. 70). Each was in an eye which had long been blind and showed other signs of degeneration. At the pupillary margin there was a clearly defined hyaline layer covered by proliferating, partly pigmented endothelial cells. The pigment layer was diminished, had indentations, and ended in a point behind the sphincter. The author thinks that the hyaline substance came chiefly from hyaline degeneration of the endothelium of the iris and partially from that of the iris tissue.

XV.—CHOROID.

486. LEWIS, I. D. **A case of triple rupture of the choroid coat.** *Ophth. Rec.*, July, 1904.

487. JOYCE. **Detachment of the choroid.** *Brit. Med. Jour.*, 1904, ii., p. 182.

488. KEY. **A case of sarcoma of the choroid with necrosis within.** *Hygeia*, 1904.

LEWIS (486) considers the following points of interest in his case: Two months after injury the eye presented three typical choroidal ruptures—one in the nasal half of the fundus, one vertical on the temporal side, and one horizontal near the macula. There was no deposition of pigment about the margins. Near the macula there were small whitish spots. ALLING.

KEY'S (488) patient was a woman, thirty-four years old, who was suddenly seized with pain in her right eye and at the same time noticed that the vision of this eye was very bad. There was a ciliary injection on the temporal side corresponding to a circumscribed detachment of the retina. Tension normal. The diagnosis was made of a sarcoma of the choroid. The ciliary injection, which was ascribed to a complicating episcleritis, disappeared under treatment with sodium salicylate. The retinal detachment gradually increased, while the tension sank below normal. The eye was enucleated about a year after the begin-

ning of the disease, and a small choroidal sarcoma with a relatively large necrotic centre was found on the temporal side. The vessels of the tumor showed hyaline degeneration. According to the author the necrosis in this case is to be ascribed not to infection, but to the hyaline degeneration of the vessels.

DALÉN.

XVI.—VITREOUS.

489. HIRSCH, G. **A persistent hyaloid vessel.** *Arch. f. Augenheilk.*, l., p. 312.

HIRSCH (489) saw in the left eye of a man, fifty-nine years old, a movable cord of the thickness and appearance of the central vein of the retina, which ran through the vitreous from the mesial margin of the papilla to the nasal margin of the lens. The eye was 6 or 7 D hypermetropic.

XVII.—GLAUCOMA.

490. VALUDE. **Apropos of the question of iridectomy in intermittent glaucoma.** *Soc. d'opht. de Paris*, July 4, 1904.

VALUDE (490) disputes the correctness of the idea advanced by Abadie, that in any case of glaucoma which manifests itself only by occasional colored vision or lowering of vision the only rational and absolutely safe treatment is an iridectomy performed as early as possible. In four such cases, after faultless iridectomy, he obtained one good result and one fairly good. In one of the others the operation was followed by loss of vision, in the other by absolute glaucoma. BERGER.

XVIII.—SYMPATHETIC OPHTHALMIA.

491. AHLSTRÖM. **Contributions to the subject of sympathetic ophthalmia. I. Sympathetic ophthalmia after panophthalmitis. II. Sympathetic ophthalmia completely healed during an intercurrent attack of fever.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 193.

AHLSTRÖM'S (491) first case was one in which irido-choroiditis appeared in the second eye seven months after panophthalmitis of the first had resulted in spontaneous perforation and atrophy. In spite of inunctions, atropine, and enucleation of the atrophic eye the patient gradually became blind. The author believes that this case proves that panophthalmitis may cause sympathetic ophthalmia. His second case was one in which marked

sympathetic inflammation improved during repeated severe attacks of climatic fever, apparently malaria, and nine years later had a vision of §. The author thinks this case is analogous to those in which certain diseases of the eye recover during an intercurrent attack of facial erysipelas.

Sections XIX.–XXII. Reviewed by Dr. H. MEYER.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

492. Jameson, T. H. **Transient monocular blindness.** *Ophth. Record*, June, 1904.

493. Frank, Mortimer. **A comparative study of the normal and subnormal color perception in its relation to distant signal lights.** *Ophth. Record*, Aug., 1904.

494. Fridenberg, Percy. **Sclerosed nerve fibres following retinal traumatism: a hitherto undescribed ophthalmoscopic picture.** *N. Y. Eye and Ear Infirm. Report*, Jan., 1904.

495. Shoemaker, W. T. **Obstruction of the central retinal artery.** Report of a case. *Amer. Jour. Med. Sci.*, Apr., 1904.

496. Hirschberg, J. **Cyanosis of the retina.** *Arch. f. Ophth.*, lix., 1, p. 131.

497. Valude. **Arteritis and retinal ischæmia.** *Soc. d'opht. de Paris*, April 12, 1904.

Jameson (492) presents the case of a man, eighty-four, who suffered from attacks of complete blindness in one eye, each lasting about five minutes. The first examination showed practically a healthy eye. A few days later, while examining the fundus, the retinal arteries and veins were observed to fade into mere lines, and the eye became blind. After two minutes the circulation was re-established. The basis of the trouble was considered to be degenerative changes in the blood-vessels.

Alling.

Frank (493) calls attention to the fact that considerable individual variation exists in the distance at which colored lights may be distinguished, and emphasizes the practical importance of tests for railroad men under the actual conditions met with in practice. He advocates the use of Nels's signal glass, on account of its purity of color and high transparency. Alling.

The changes found by Fridenberg (494) appeared to be in the superficial layers of the retina, and consisted of hair-like striations, following the course of the nerve fibres of the retina. Their origin was invariably at the site of a foreign body or

cicatrix. He thinks that the appearances may be due to sclerosis of the originally transparent nerve fibres. Three illustrative cases are reported. ALLING.

SHOEMAKER (495) believes that his case, which presented in general the signs of so-called embolism of the retinal artery, was one of thrombosis, because there was alteration in the blood current, as evidenced by the weak pulse, and because the patient had nephritis, and undoubtedly had changes in the vessel walls. He thinks the obstruction was near the bifurcation of the artery and affected the lower branch. ALLING.

HIRSCHBERG (496) reports two cases of cyanosis of the retina. In one there was a moderate degree of kyphosis, with great cyanosis of the skin and mucous membranes. The terminal phalanges of the fingers were thickened, the veins of the extremities distended. The patient had emphysema of the lungs and dilatation of the right ventricle of the heart. Ophthalmoscopic examination showed that the retinal arteries were normal, the veins very tortuous, dilated to twice their normal breadth, filled with dark blood, the margins of the optic disc not clearly defined. No hemorrhages were present. In the second case, the same ophthalmoscopic picture was to be seen, together with all the symptoms of congenital cyanosis. The cause was a congenital malformation of the heart. There are only three other recorded cases of retinal cyanosis.

VALUDE (497) reports the case of a patient suffering from Bright's disease, in whom a retinal artery was changed into a white cord by arteritis obliterans. A corresponding section was absent from the field of vision. There was arteritis in the other eye as well, but it had not occluded the vessels. No history of syphilis. There were psychic and motor disturbances, which suggested that similar changes had taken place in the arteries of the central nervous system. BERGER.

XX.—OPTIC NERVE.

498. GEHRUNG, J. A. **The diseases of the optic chiasm.** *N. Y. Eye and Ear Infirm. Report*, Jan., 1904.

499. GILBERT. **Medullated nerve fibres of the optic papilla.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 124.

500. REIS, V. **An abscess in the lamina cribrosa of the optic nerve as a complication of an orbital phlegmon.** *Arch. f. Ophth.*, lix., p. 155.

501. Menche, Amandus. **A case of severe bilateral papillitis after a mastoid operation.** *Inaug. Dissert.*, Giessen, 1904.

502. Knapp, A. **Hereditary optic atrophy.** Arch. of Ophth., xxxiii., 4, p. 383.

Gehrung (498) presents an interesting collection, with abstracts, of the 102 reported cases of disease of the chiasm. Acromegaly, syphilis, tuberculosis, carcinoma, sarcoma, fibroma, aneurism, cysts, and fracture of the base are among the principal causes. Autopsies confirmed the diagnosis in 59 cases. The fact that the causative diseases are so varied and are so frequent in occurrence leads to the conclusion that lesions in this locality are either very rare or commonly unrecognized.

Alling.

Gilbert (499) describes a case observed by him, in which the papilla and its vessels were completely covered by medullated fibres. A great part of the vessels were visible in places where the surroundings were perfectly white, and so gave the impression that they bent upward. Eversbusch advanced the theory that the insertion of the lamina cribrosa in the distal portion of the optic nerve had perhaps an influence on the loss of medulla by the nerve fibrils which had retained it up to that point, and assumed that the lamina was absent when these sheaths persisted throughout the nerve. No anatomical confirmation of this view was obtained by Manz and Mayweg. Gilbert assumes in his case that all the fibres retained their sheaths in the lamina.

Changes in the central nervous system during the course of an orbital phlegmon can be due to mechanical pressure, to involvement of the central vascular system, or to the influence of bacteria. Reis (500) reports a case, with the autopsy, in which a local infection with pyogenic micro-organisms had taken place on the upper lip. The infection was transmitted by way of the veins to the cellular tissue of the orbit, and thence to the cavernous sinus. Death followed. Ten days after the infection there was amaurosis. The microscope revealed an abscess in the lamina cribrosa. The changes present in the eye at the time could not be considered able to produce the amaurosis, so Reis thinks its direct cause was the abscess in the lamina cribrosa. The infection took place by way of the venous anastomosis which joins the capillary network of the choroid with the vascular network of the intraocular end of the optic nerve.

Menche (501) reports a case of mastoiditis with formation of

granulations, which was submitted to operation. A marked papillitis ensued, which disappeared completely without leaving subsequent signs.

KNAPP (502) investigated the members, through three generations, of one family which suffered from optic atrophy. Even the females were not spared. Through one of them the affection was transmitted to the third generation.

XXI.—INJURIES, FOREIGN BODIES, PARASITES.

503. WATERMAN, O., and POLLACK, B. **Fracture of the basis cranii followed by atrophy of both optic nerves and peculiar psychic phenomena.** *Jour. Ment. and Nerv. Dis.*, April, 1904.

504. LEWIS, F. N. **Case of foreign body remaining in the lens of the eye for six years with the lens otherwise clear.** *Med. Record*, Aug. 6, 1904.

505. HUWALD, G. **Clinical and histological conditions after injury of the cornea by the sting of a bee.** *Arch. f. Ophth.*, lix., p. 46.

506. BERNARD, H. L., and RIGBY, H. M. **Pulsating exophthalmos due to aneurism of the internal carotid artery.** *Annals of Surgery*, May, 1904.

The case of WATERMAN and POLLACK (503) falls in line with those forms of atrophy of the optic nerve which follow fracture through the optic foramen. It was peculiar in that the atrophy appeared late—in one eye eight months, in the other nine and a half months after the injury. ALLING.

HUWALD (505) observed a patient who had been stung by a bee in the left cornea. In the course of time a quadrangular, whitish-gray spot appeared on the anterior capsule of the lens, much resembling an anterior capsular cataract. In order to explain this condition, as the bee-sting had not come in contact with the anterior capsule, Huwald instituted experiments in which he studied the effects of bee-stings in forty-five rabbits' eyes. In addition to the irritation of the cornea and iris, an interesting change in the lens capsule was caused by the bee poison. A fine subcapsular opacity in the contracted pupil appeared in the course of an hour after the sting, for two days grew larger and thicker, and persisted several days longer. It was confined to the most anterior layer of the cortex. As it retrograded there appeared nearer the middle a small whitish opacity like a stellate cataract. The first opacity was due to disintegration of the epithelium and the neighboring part of the lens, the second corresponded to an irregular proliferation of several layers of the capsular epithelium. As the author explains

the process, the poison of the bee destroys the capsular epithelium by its toxic action and thus provides opportunity for the aqueous to penetrate the capsule. As the poison gradually disappears from the eye with the change of aqueous, the intact epithelium at the margin of the defect begins to proliferate copiously, perhaps because of the proliferative action of the poison already observed in the cornea. It is probable that the onset of anterior polar cataract in these cases, which Treacher Collins ascribed to contact between the lens capsule and cornea after a perforating ulcer, is due to the penetration of the lens capsule by toxins in the aqueous, which causes degeneration or proliferation of the capsular epithelium and results in true capsular cataract.

Bernard and Rigby (506) describe a case of bullet wound of the base of the skull in which pulsating exophthalmos developed. The common carotid was ligatured and the operation resulted in the disappearance of the proptosis. The patient died from cerebral abscess two months and a half after the injury. The autopsy revealed two sacculated aneurisms in the intracranial portion of the carotid artery—one at the first bend in the petrous bone, the other on the outer side of the artery in the posterior half of the left cavernous sinus. There was no communication between the carotid and the sinus. The interest in the case lies largely in the demonstration that pulsating exophthalmos can be produced by an aneurism without direct arterio-venous communication, which is certainly present in the great majority of cases.

Alling.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASES.

507. Gould, G. M. **The non-operative relief of eye-strain for the possible cure of epilepsy tested in 68 cases at the Craig Colony.** *Amer. Med.*, April 9, 1904.

508. Oliver, C. A. **Clinical and histologic study of the ophthalmic conditions in a case of cerebellar neoplasm occurring in a subject with renal disease.** *Amer. Jour. Med. Sci.*, June, 1904.

509. Swasey, Edw. **A case of exophthalmos of the left eye of obscure origin.** *Ophth. Record*, June, 1904.

510. Shute, B. K. **The value of a knowledge of abnormal mobility of the iris as an aid in diagnosing diseases of the nervous system.** *Med. News*, July 30, 1904.

511. Dana, C. L. **Eye-strain and the psychoses.** *Med. News*, July 30, 1904.

512. Cutler, C. W. **Migraine and sick headache.** *Med. News*, July 30, 1904.

513. Holden, W. A. **The eye symptoms of hysteria, neurasthenia, and the traumatic neuroses.** *Med. News*, July 30, 1904.

514. Altland, W. **Experiments in regard to the pathogenesis of disturbances of vision in quinine poisoning.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 2, p. 1.

515. Bistis, J. **Ocular complications during lactation.** *Arch. d'opht.*, xxiv., No. 7.

516. Dobrochatow, W. **Malarial diseases of the nervous system.** *Med. Obosr.*, 1903, No. 21. Review in *Westn. Ophth.*, 1904, No. 3.

517. Monthus, A. **An atypical form of ocular tuberculosis.** *Arch. d'opht.*, xxiv., No. 8, p. 541.

518. Lagrange and Aubaret. **Congenital syphilis of the eye.** *Arch. d'opht.*, xxiv., No. 8, p. 510.

519. Orlow, K. Ch. **Changes in the tissues of the eye in purpura hemorrhagica.** *Westn. Ophth.*, 1904, No. 5.

520. Loeser. **Coincident myasthenia and exophthalmic goitre, with remarks on the ocular symptoms of myasthenia.** *Zeitschr. f. Augenheilk.*, xii., p. 368.

521. Loeser. **The ocular symptoms in aneurism of the internal carotid artery.** *Arch. f. Augenheilk.*, l., p. 183.

522. Morax and Patry. **Blindness and cranial deformity.** *Soc. d'opht. de Paris*, July 5, 1904.

523. Frenkel. **Fluctuating mydriasis, or fluctuating inequality of the pupils.** *Arch. d'opht.*, xxiv., No. 9, p. 596.

524. Meige. **Ophthalmic migraine with hemianopsia.** *XIV Congrès des méd. alienistes et neurologistes français*, Pau, Aug. 1–7, 1904.

525. Lafou and Delord. **Tumor of the base of the brain. Neuroparalytic keratitis with lagophthalmos.** *Rev. gén. d'opht.*, xxiii., p. 337.

526. Leri. **Influence of amaurosis on the motor and sensory troubles in tabes.** *Soc. de neurol.*, April 14, 1904.

527. Cannes and Chiray. **Intermittent Argyll-Robertson symptom.** *Ibid.*, Dec. 3, 1903.

528. Teillais. **Ocular hystero-traumatism.** *Rec. d'opht.*, xxii., p. 333; *Bull. et mém. de la soc. française d'ophtalmologie*, 1904.

Gould (507) asserts that in three months 9 out of 57 patients showed a reduction in the number of seizures of 382 and advises a permanent resident ophthalmologist in such institutions as the Craig Colony. Alling.

Oliver (508) finds his case of interest in the following particulars: A cerebellar sarcoma forming in a subject affected with renal disease. A macular chorio-retinitis with characteristic appearances of true albuminuric retinitis eight years before the beginning of the neuro-retinitis due to the intracranial pressure. There was also progressive external and internal ocular paralysis. Alling.

A healthy-looking woman of twenty-four consulted SWASEY (509), giving the history of having been suddenly attacked one month before with paralysis of the external rectus of the left eye. After an interval of two months she presented decided exophthalmos which had steadily increased for a week. There was no pain, congestion, or œdema about the eye. No tumor could be felt in the orbital cavity. There was well-marked optic neuritis with bright spots about the macula resembling albuminuric retinitis. She was absolutely blind in this eye. The kidneys, heart, and thyroid were normal. She was given potassium iodide and mercurial inunctions with electric treatment in the form of the Faradic current. After three months the nerve was atrophic but the paralysis of the externus and the exophthalmos had entirely disappeared. The author is in the dark as to the nature of this case, apparently not considering syphilis the cause. ALLING.

ALTLAND (514) injected muriate of quinine subcutaneously into ten animals, rabbits, cats, and dogs, then killed them, and examined their eyes according to Nissel's method. After a single large dose there were found hypercolorization and slight chromatolysis. In animals subjected to frequent injections there were likewise hypercolorization and chromatolysis, and only when the repeated injections had succeeded in bringing about disturbances of vision and ischæmia of the retina were serious changes found in the cells. Chromatolysis and hypercolorization are to be considered the morphological changes produced by the chemical affinity or the physical action of the quinine upon the cells. Prolonged action of the poison finally destroys the ganglion cells so that only a homogeneous layer remains. The author attributes only a secondary importance to the ischæmia, and this importance may be in the unfavorable nutritive conditions of the ganglion cells which have been badly injured by the poison. The return of the central portion of the field in men, with severe injury of the central vision, can be explained by the thicker layer of ganglion cells at this place. The optic nerves of the last six animals were treated according to Marchi's method and signs of degeneration were found throughout, which could be followed up to the primary ganglia. Altland supposes, therefore, that there is a toxic action on all the primitive fibrils.

The first case reported by BISTIS (515) was that of an otherwise healthy woman, thirty years old, in whom a hemorrhagic neuro-retinitis appeared during lactation. It passed away al-

most completely, but recurred three years later during the last month of pregnancy. In the second case, an iritis appeared in the eleventh month of lactation, which recovered under the usual treatment after the child had been weaned. According to the author's opinion, the visual disturbances during lactation, usually associated with papillitis or retrobulbar neuritis, are not due to relaxation, as this is absent in the affected as well as in the other cases. The disease also does not begin in pregnancy, to grow worse in lactation, as its not very late appearance might seem to indicate. The true cause is rather an infection or auto-intoxication by the products of disintegration of the albumin at the commencement of the secretion of milk, sometimes before the end of pregnancy. v. MITTELSTÄDT.

DOBROCHATOW (516) observed in an eighteen-year-old patient ataxia of the cerebellar type, dysarthria, and horizontal nystagmus, more marked on looking to the left. In the blood were plasmodium rings and crescents of the tropic type. Romberg's symptom was marked. HIRSCHMANN.

In the case described by MONTHUS (517) an eighteen-year-old girl had a sclero-choroidal tumor in the inner-upper part of the eyeball reaching nearly to the cornea. It was from 5 to 10*mm* high, slightly rough, and adherent to the conjunctiva. At a place corresponding to the tumor the retina was grayish white with gray nodules. Tension normal. Vision 0.3, central leucoma. The entire appearance of the tumor, as well as that of a fungoid ulcer below the nipple and of a bony cicatrix on the middle finger, indicated tuberculosis. This diagnosis was confirmed by inoculation and discovery of tubercle bacilli. The tumor was removed and the site of its scleral origin cauterized, and on recurrence treated again in the same way. Recovery with same vision as before. In the place of the former changes in the retina there were some white streaks, and in the choroid several round atrophic places. v. MITTELSTÄDT.

The case reported by LAGRANGE and AUBARET (518) was one of iridocyclitis with slight signs of irritation, much opacity of the cornea, with a thick exudate on its posterior surface, and numerous miliary nodules in the iris. Glaucomatous increase of tension. The diagnosis of hereditary syphilis was made from the results of treatment, although no subjective signs were present. Injections of tuberculin were negative. Recovery was followed by a recurrence with marked increase of tension. Recovery with

vision = ½. The authors consider the case one of inflammation of the anterior part of the uveal tract which could be classed neither as interstitial keratitis nor as hydrophthalmos.

V. MITTELSTÄDT.

ORLOW (519) examined the eyes of a patient who had died of purpura hemorrhagica, and found in different parts of the retina thickenings due to accumulations in the inner layers, and detachments here and there by extravasations and exudates. The vessels were changed, the endothelial nuclei swollen and protruding into the lumen, the walls were less compact. In several places the external limiting membrane had been destroyed by extravasations, but not the internal limiting membrane. There were collections of blood between the retina and the vitreous where diapedesis must be admitted to have occurred. There were no changes in the optic nerve. There were collections of blood in the ciliary body and iris, especially at the root of the latter. The same changes were present in the iritic as in the retinal vessels. The extravasations must be ascribed partly to rupture of the vessels, partly to diapedesis. HIRSCHMANN.

LOESER (520) reports two cases of combination of myasthenia and Basedow's disease and describes the ocular symptoms of myasthenia. First he considers as characteristic a monocular or binocular ptosis. Occasionally there are paralytic symptoms of the other extrinsic muscles, but none of the intrinsic musculature have been observed. Often there is a weakness of the orbicularis with the production of lagophthalmos. More rarely in addition to the signs of limitation of function there are signs of irritation in the form of quivering of the lids, nictitation, or blepharoclonus. The paralytic symptoms can increase in both intensity and extent. Other, non-ocular symptoms necessary for the diagnosis are, the voice quickly becomes hoarse, there is difficulty in chewing and swallowing, weakness of the muscles of the head and neck, and the limbs quickly become weary. The diagnosis can be confirmed by demonstration of the "myasthenic reaction."

LOESER (521) reports a case of aneurism of the internal carotid in which all the symptoms pointed to an intraorbital growth. The clinical symptoms followed an attack of erysipelas. In the course of the observation a pulsating vascular murmur, synchronous with the pulse and influenced by compression of the carotid, was detected in the temporal region. The variety of the symp-

toms in the few cases of carotid aneurism mentioned in literature is explained by the varying position of the aneurism with regard to the cavernous sinus. The author recommends auscultation of the skull as important in making a diagnosis. Therapeutically ligature of the carotid offers a more favorable prognosis in traumatic carotid aneurism than in aneurism of other etiology.

Morax and Patry (522) exhibit the photographs of seven cases of trochocephalus with post-neuritic optic atrophy. In each case the blindness came on before the tenth year in the course of about three months. Only forty-two similar cases have been published. The authors think that probably several of the processes which have been ascribed as the cause of the atrophy exist simultaneously and produce premature closure of the bony sutures and optic neuritis. It is necessary that cases should be observed during the beginning of the trouble to determine with regard to meningitic or other symptoms. Berger.

Frenkel (523) shows that in examination of the size of the pupil, especially in cases of so-called fluctuating mydriasis, that of each eye should be made under the same conditions and equal illumination, because otherwise one may obtain a so-called pseudomydriasis which may be due to other causes as well as simulation. After an historical account of this phenomenon the author presents an analysis of the observations on the appearance of fluctuating mydriasis and its dependence on organic changes, especially of the central nervous system. It is met with in progressive paralysis, in which it is frequently, but not always, a late symptom, tabes, multiple sclerosis, and mental diseases, as well as being a functional disturbance in such general diseases as pneumonia, pleurisy, nephritis, and typhus, and in such neuroses as Basedow's disease, hysteria, hystero-epilepsy, and neurasthenia. The author doubts the occurrence of fluctuating mydriasis in perfectly healthy persons. v. Mittelstädt.

Meige (524) reports a case of attacks of migraine accompanied by hemianopsia and aphasia in a woman seventy-three years old. The attacks began after the menopause. He believes the attacks were due to temporary spasms of the vessels, the localization of which he found it difficult to determine. Berger.

Leri (526) considers incorrect the theory that the motor and sensory functional disturbances make no further progress after the appearance of optic atrophy in tabes. In the thirty-two cases

of tabes which he observed the optic atrophy preceded sixteen times and followed fourteen times the other clinical symptoms of the disease. In two cases the optic atrophy appeared simultaneously with the other symptoms. BERGER.

CANNES and CHIRAY (527) observed a patient twenty-two years old suffering from tabes dorsalis in whom the Argyll-Robertson symptom was present only during the gastric crises, which were severe. At other times the functions of the pupils were normal. BERGER.

In TEILLAIS'S (528) first patient, thirty-two years old, after a fall which caused laceration of the skin of the forehead and of the left upper lid, amblyopia appeared in the left and then in the right eye, which went on to almost total blindness. There was anæsthesia of the conjunctiva on both sides, of the cornea on the left. The pupils were equal and reacted well. Fundus normal. Treatment in vain. A year later, without apparent cause, the vision of the right eye returned within a few hours, that of the left improved and the fields became enlarged, but the anæsthesia of the conjunctiva and cornea persisted.

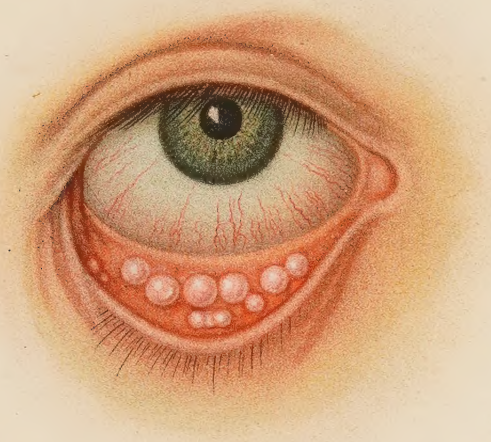
In his second case, two months after a blow with a ball on the right eye, blindness suddenly appeared in both with complete anæsthesia of the conjunctiva. The latter disappeared after the vision suddenly returned to a concentrically contracted field.

In another case slitting of the canaliculus of the right eye was followed by an hysterical spasm. On the next day there was anæsthesia of the right side of the face and of the right arm, with blepharospasm on the same side which persisted for fourteen days.

In another case, three days after a railroad accident, there was complete blindness of the left eye, the condition of which was ophthalmoscopically normal. Recovery eight days later. Recurrence three months later for four days, after the patient had for some time made an attempt at simulation.

V. MITTELSTÄDT.

Fig. 1.



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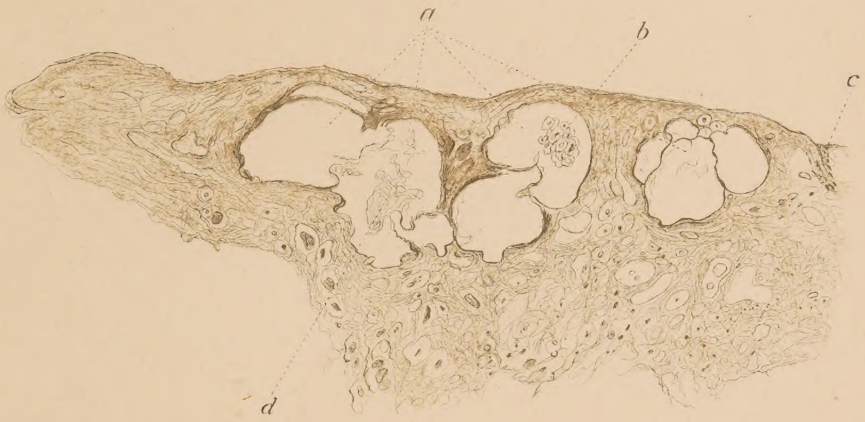
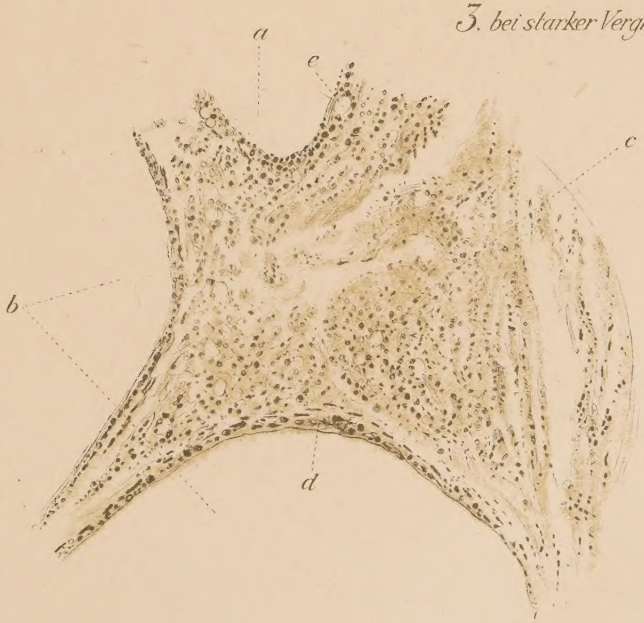
2. Schnitt durch die Bindehaut bei schwacher Vergrösserung.



3. bei starker Vergrösserung.



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